COAL AGE

Vol. 4 NEW YORK, AUGUST 30, 1913 No. 9

Just Between Friends

Doubtless your pay isn't highly luxurious,
Surely your job isn't easy or light,
Doubtless your life is a trifle penurious
Still—are you doing your labor all right?
Have you been fair to the man who is paying you—
Have you been honest and square with the boss?
Isn't your laziness often delaying you—
Hasn't your carelessness caused him a loss?

No one denies that your task is laborious,
No one denies that you're often oppressed;
Still we would ask—though in no wise censorious,
Have you been faithfully doing your best?
Haven't you wasted a lot of coal needlessly—
Haven't you tried to get credit for slate?
Haven't you monkeyed with peril quite heedlessly—
Dallied with danger and frivoled with fate?

While you are thinking of grievances various,
Maybe the boss has a grievance or two,
Maybe his business is mighty precarious
Simply because of the things that you do;
Bosses there are who are wrong in their attitude
Greedy and selfish and crazy for pelf,
But—have YOU really shown fairness and gratitude—
Have you been doing the square thing yourself?

IDEAS AND SUGGESTIONS

Cleaning Coal

By Josiah Keely*

A story is told by a mine foreman on his old boss, who now holds high office in one of our largest bituminous-coal companies:

"Talk about cleaning coal—we had to clean it when I dug coal for Old Man ————. I was driving one of the best headings in the mine, and there were a dozen other fellows waiting for my place. He came in one morning and began looking up and down the sides of the track like he had lost a dime. Pretty soon he stopped and held his light up into my face and said: 'Where are you throwing your dirt?' 'I says, 'There ain't no dirt in this coal.' He didn't even look at the coal, but said, 'Young man you want to find something by the time I come around again.'

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We can still imitate our old friend, the Boss, in going to the proper place to begin. Clean coal still depends, not so much on what is picked out at the tipple, as what is thrown back in the working places, and, on the whole, it is perhaps not much harder to require the proper service from inside men than from those outside at the tipple. Of course, the daylight is an advantage, but a handful of tipple men handling large tonnage can hardly be expected to do all the cleaning for the hundred miners loading up everything that is shot down.

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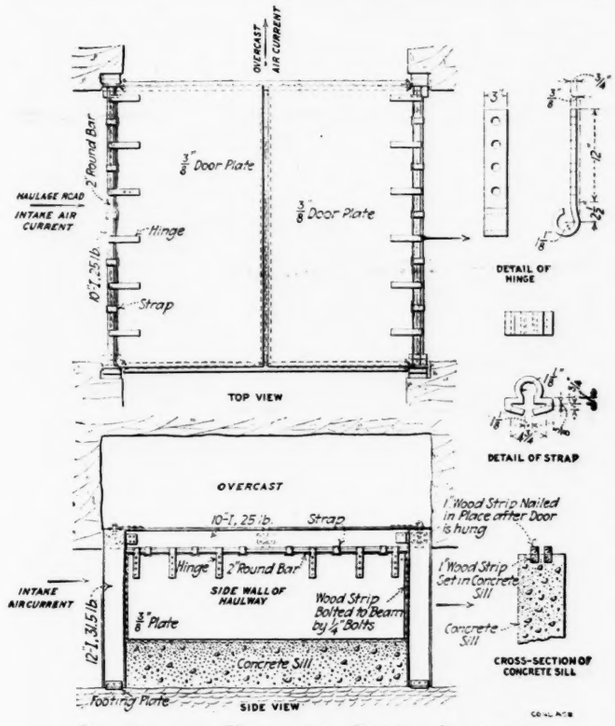

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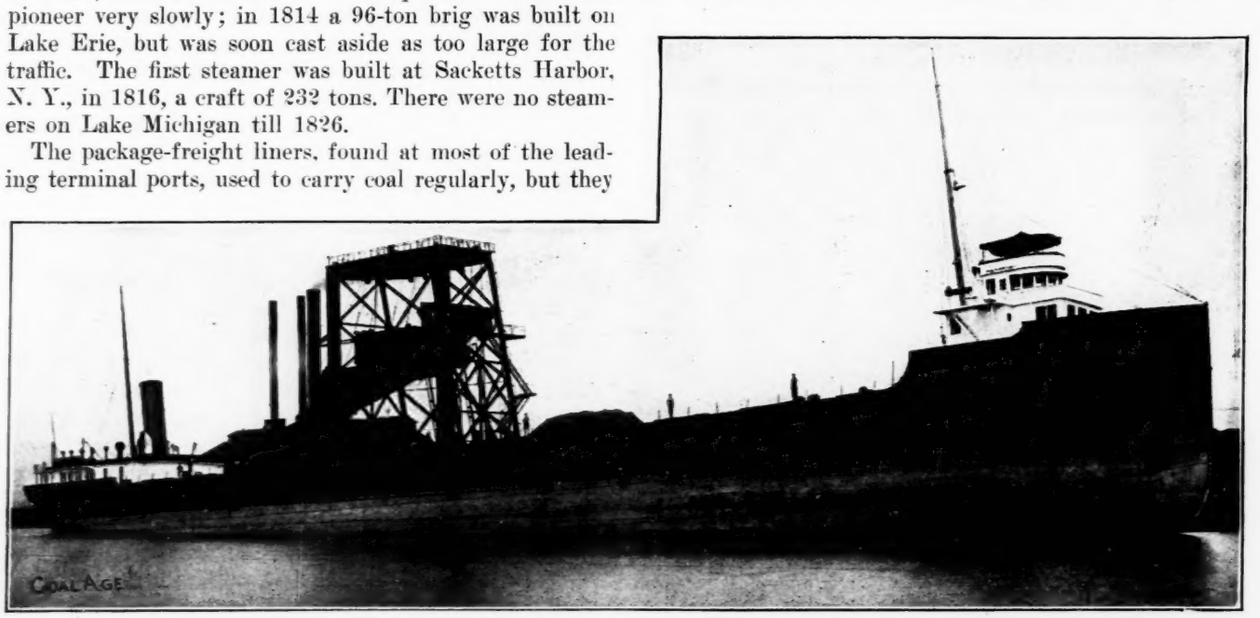

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*90 Johnson Park, Buffalo, N. Y.

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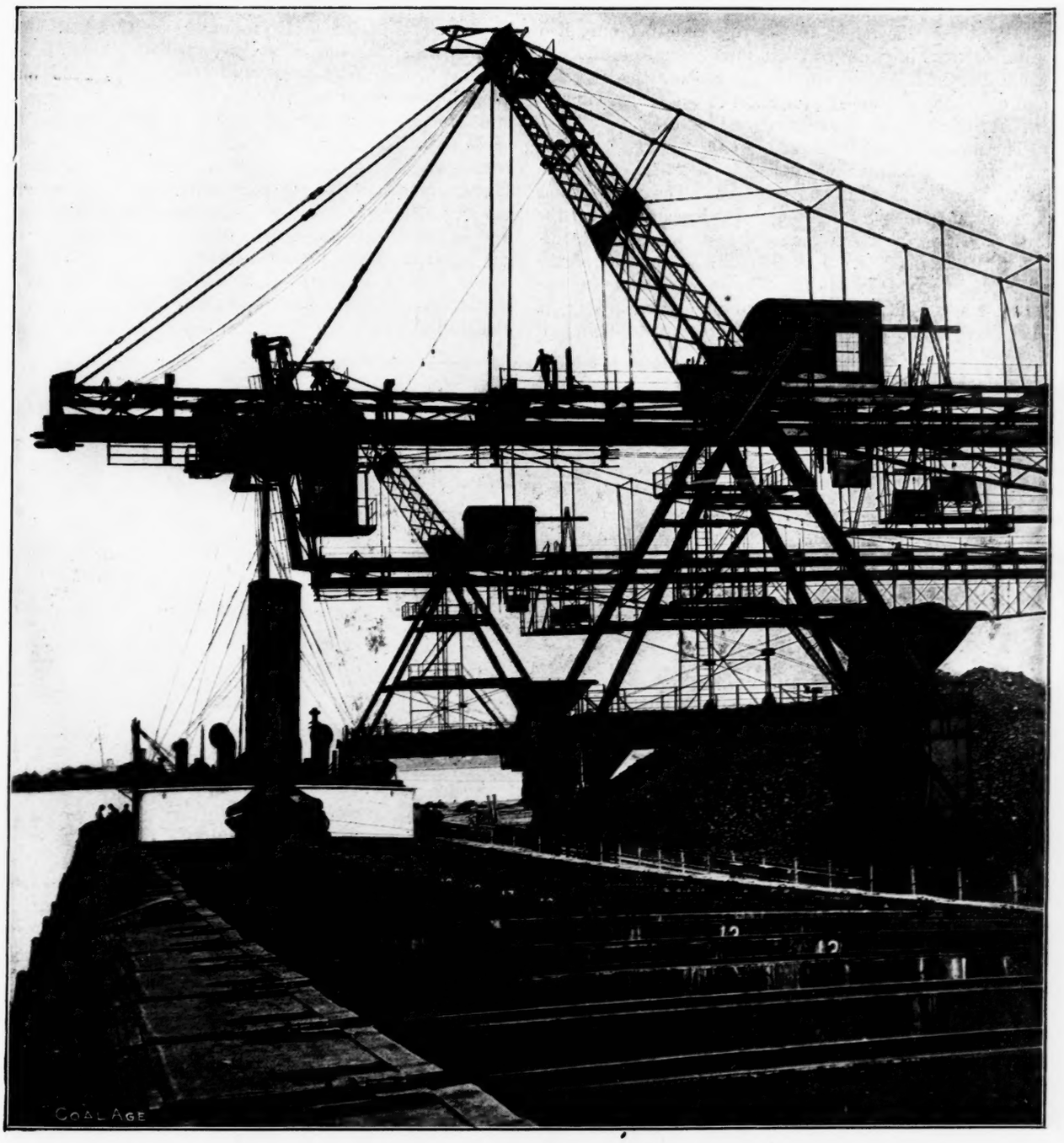
The first big revolution of bulk-freight carrying on the lakes came with the steamer "Onoko" in 1882, built of iron. Though not the first metal craft on the lakes, it had such an enormous capacity as compared with most wooden vessels that there was a rush for this new type. Older metal crafts had solved few problems, the first of them being the "Merchant," built in Buffalo in 1862. The "Onoko" merely showed the new possibilities in the size; she had two decks and the old-style stanchions to interfere with bulk-freight handling. In 1889, the "America" appeared, provided with deck beams, but no between decks. Her cargo of 3100 tons was all in a sin-



A Brownhoist Unloading a Vessel on the Upper Lakes. This Shows the Typical Open Hatch, Characteristic of the Coal Freighters

gle space, though that has since been divided into three permanent compartments, two of 900 tons, the third of 1300 tons capacity. This division was in part to strengthen the hull and also to facilitate the getting of cargoes. Except for iron ore it was difficult for a long time to get large cargoes of one commodity for the same consignee and port destination. Steamers of this class were derisively called "tin pans" and it was predicted that they would collapse in stress of weather. They did not, however, and soon a further step was taken, all in the interest of less obstructed holds to facilitate unloading bulk freight.

The Modern Type of Vessel

The steel steamer "A. B. Wolvin" was built in 1904, answering to the following description: Gross tonnage 6585 tons; capacity, 10,300; length, 540 ft.; keel, 56 ft.; beam, 32 ft.; hold, 33 ft. having 9-ft. hatches with 12-ft. centers; one compartment and arch construction. It has been found that something must be done to strengthen the deck of a vessel about her hatch openings before it was safe to remove the stanchions and to lessen the number of beams in order to increase the size of the hatches. So the arch was put in crosswise between the hatches and tied to the beams that support the deck; it was also at-

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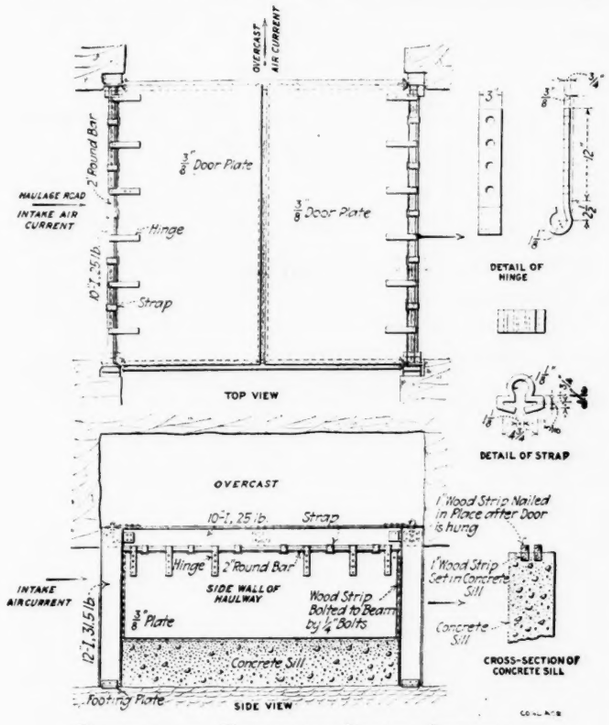

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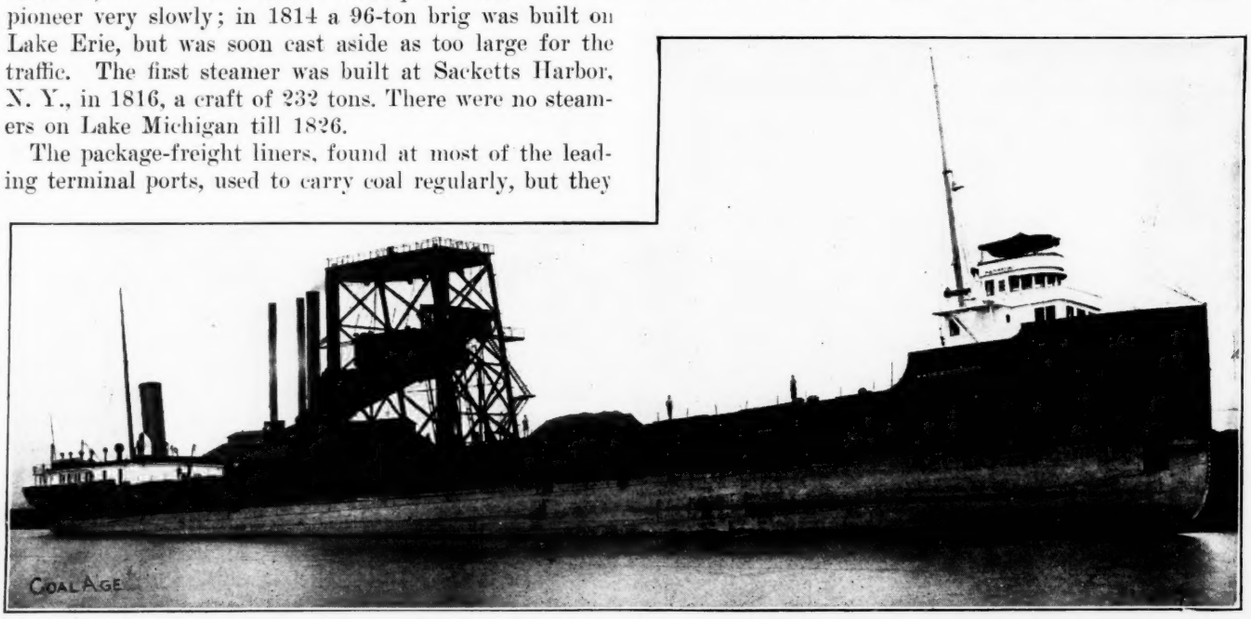

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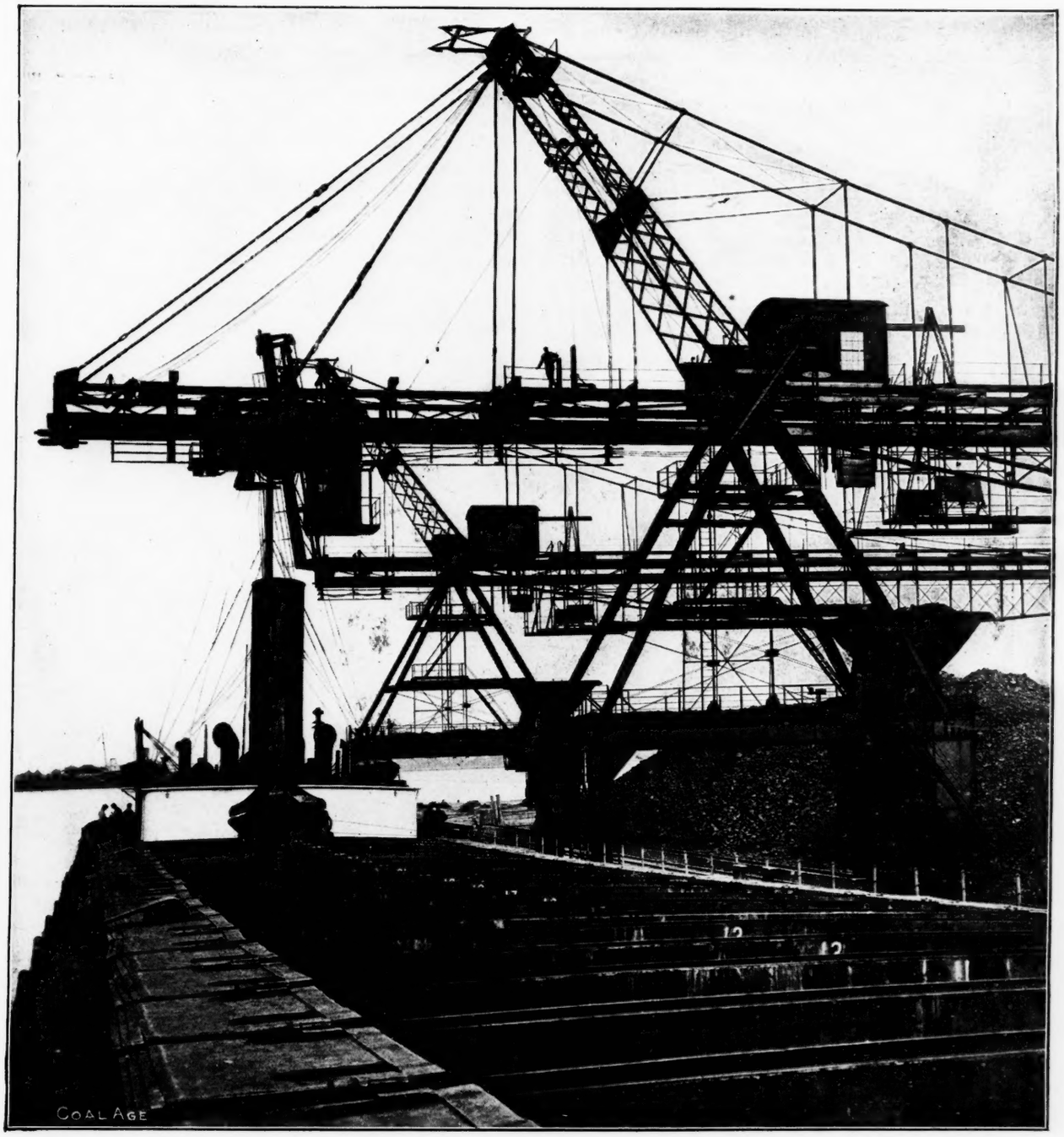
The first big revolution of bulk-freight carrying on the lakes came with the steamer "Onoko" in 1882, built of iron. Though not the first metal craft on the lakes, it had such an enormous capacity as compared with most wooden vessels that there was a rush for this new type. Older metal crafts had solved few problems, the first of them being the "Merchant," built in Buffalo in 1862. The "Onoko" merely showed the new possibilities in the size; she had two decks and the old-style stanchions to interfere with bulk-freight handling. In 1889, the "America" appeared, provided with deck beams, but no between decks. Her cargo of 3100 tons was all in a sin-

*90 Johnson Park, Buffalo, N. Y.



A Brownhoist Unloading a Vessel on the Upper Lakes. This Shows the Typical Open Hatch, Characteristic of the Coal Freighters

gle space, though that has since been divided into three permanent compartments, two of 900 tons, the third of 1300 tons capacity. This division was in part to strengthen the hull and also to facilitate the getting of cargoes. Except for iron ore it was difficult for a long time to get large cargoes of one commodity for the same consignee and port destination. Steamers of this class were derisively called "tin pans" and it was predicted that they would collapse in stress of weather. They did not, however, and soon a further step was taken, all in the interest of less obstructed holds to facilitate unloading bulk freight.

The Modern Type of Vessel

The steel steamer "A. B. Wolvin" was built in 1904, answering to the following description: Gross tonnage 6585 tons; capacity, 10,300; length, 540 ft.; keel, 56 ft.; beam, 32 ft.; hold, 33 ft. having 9-ft. hatches with 12-ft. centers; one compartment and arch construction. It has been found that something must be done to strengthen the deck of a vessel about her hatch openings before it was safe to remove the stanchions and to lessen the number of beams in order to increase the size of the hatches. So the arch was put in crosswise between the hatches and tied to the beams that support the deck; it was also at-

tached to the belt frame that runs up from the high floor inside of the side tanks, for by this time not only had water bottoms been devised, but there were side tanks of about 5 ft. in thickness running up to about the load line and affording additional protection to the cargo, but not interfering with the openness of the hold.

The improvements in the hold of the "Wolvin" worked well, but the change of hatches from 24-ft. centers to 12-ft. was not all that was required. The main beams and center stanchions were already dispensed with, the first to leave them out being the steamer "James H. Hoyt," built in 1902. The "Hoyt" also appreciated the value of transverse bulkheads, both for strengthening the vessel and for dividing the cargo into suitable lots, so that special bulkheads would not be required. This boat

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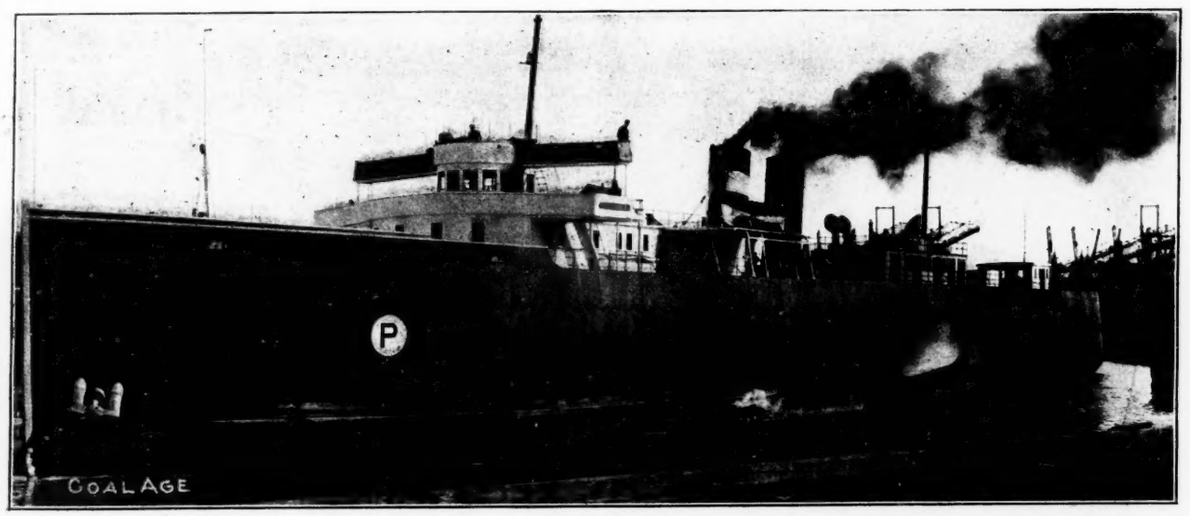

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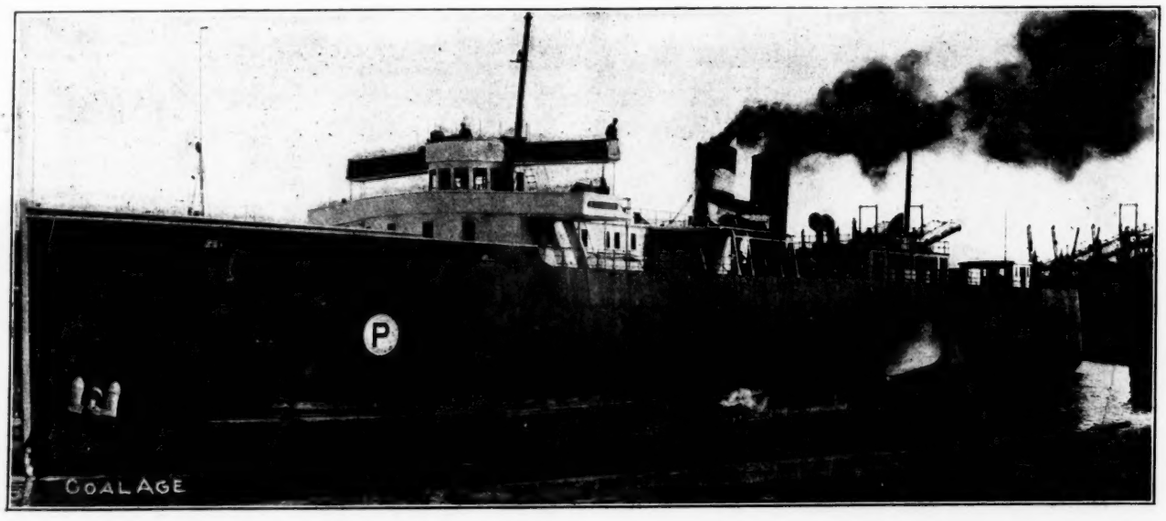

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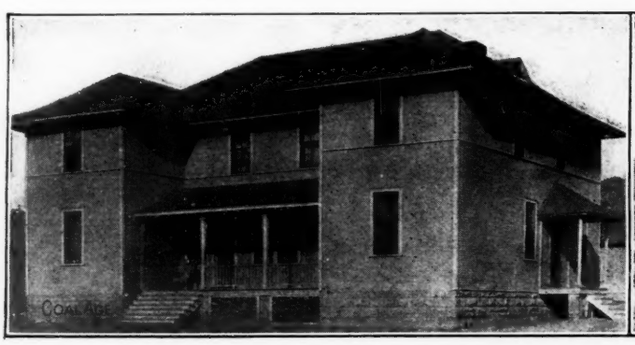
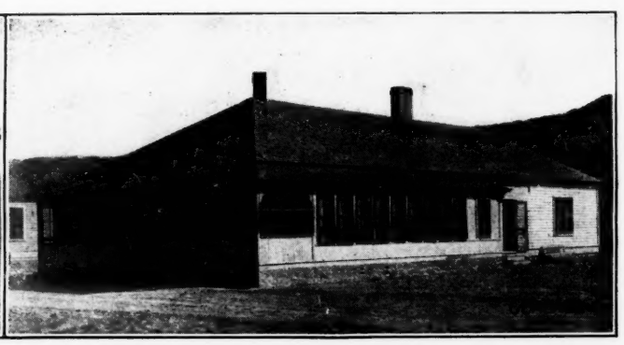
SNAP SHOTS IN COAL MINING

SAWING MINE TIMBERS, WHITE CITY, KY.

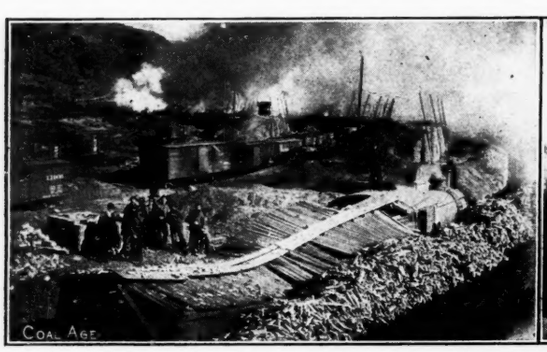
COLUMBUS COAL CO.'S CAMP, COLUMBUS, KAN.



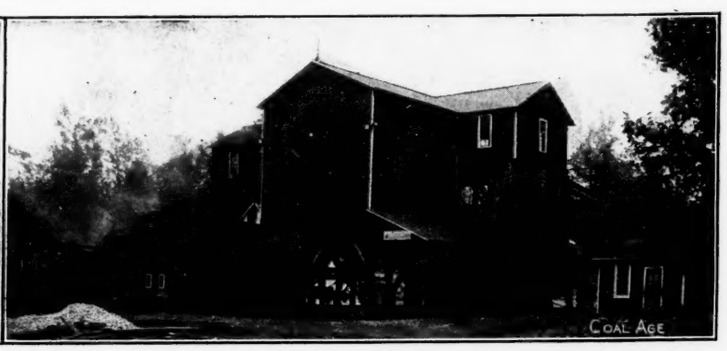
VICTOR-AMERICAN CO.'S HOTEL, HEATON, N. M.



VICTOR-AMERICAN CO.'S HOSPITAL, GIBSON, N. M.

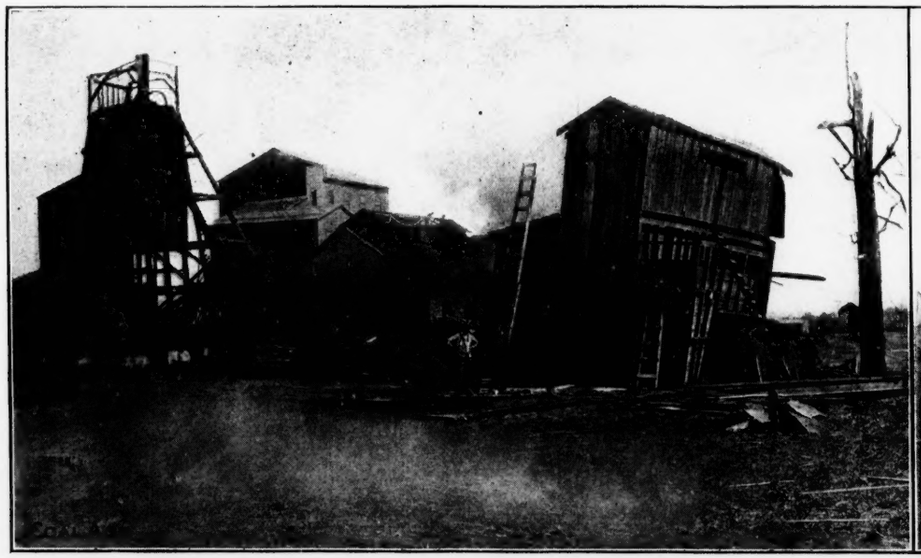


RUNAWAY LOCOMOTIVE, SUNNYSIDE, UTAH

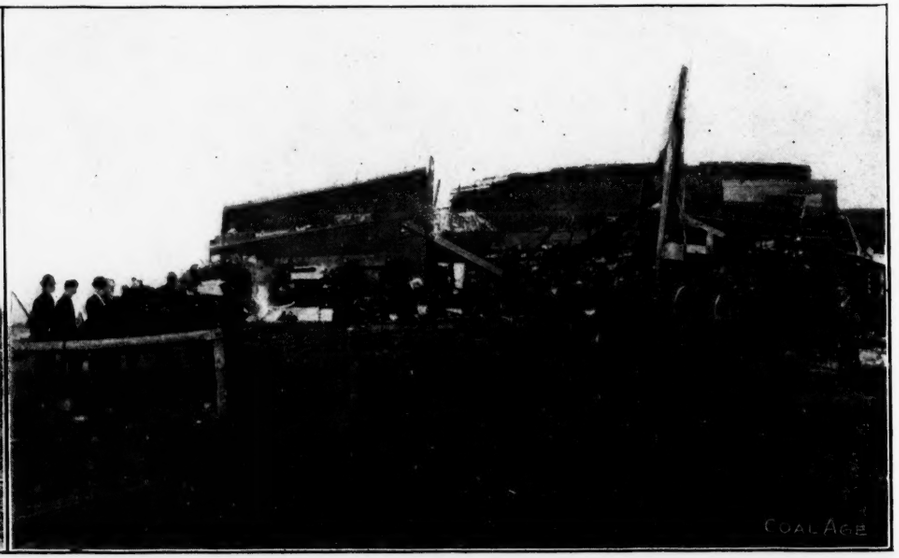


THE FOX RUN TIPPLE, ST. CHARLES, KY.

MINES NOS. 14 AND 15 AT CROWEBURG, KAN.

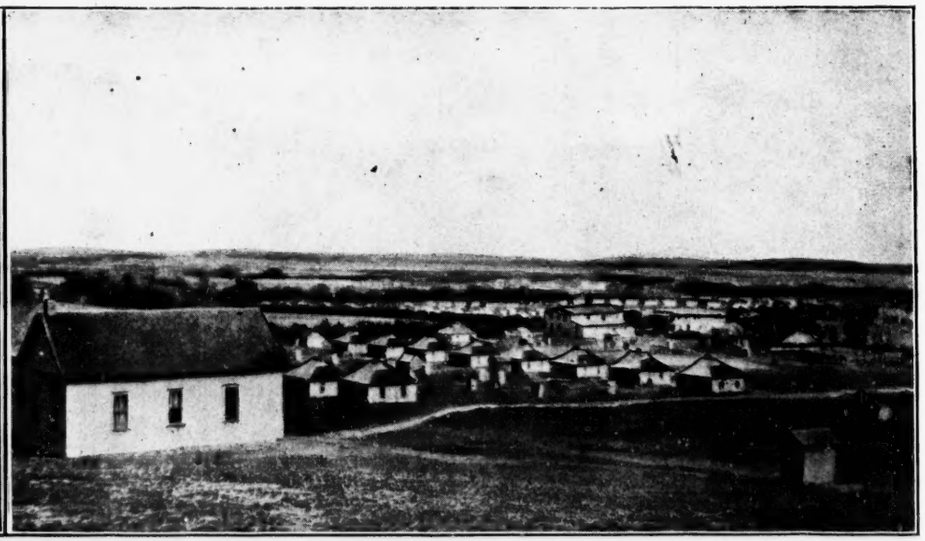


MINE NO. 1, BUSH, KAN., AFTER CYCLONE PASSED



WHAT REMAINED OF COMPANY STORE AT NO. 3 MINE

BIRDSEYE VIEW, LOOKING EAST, RED LODGE, MONT.



SHOWING CROWEBURG, KAN., FROM RESERVOIR HILL

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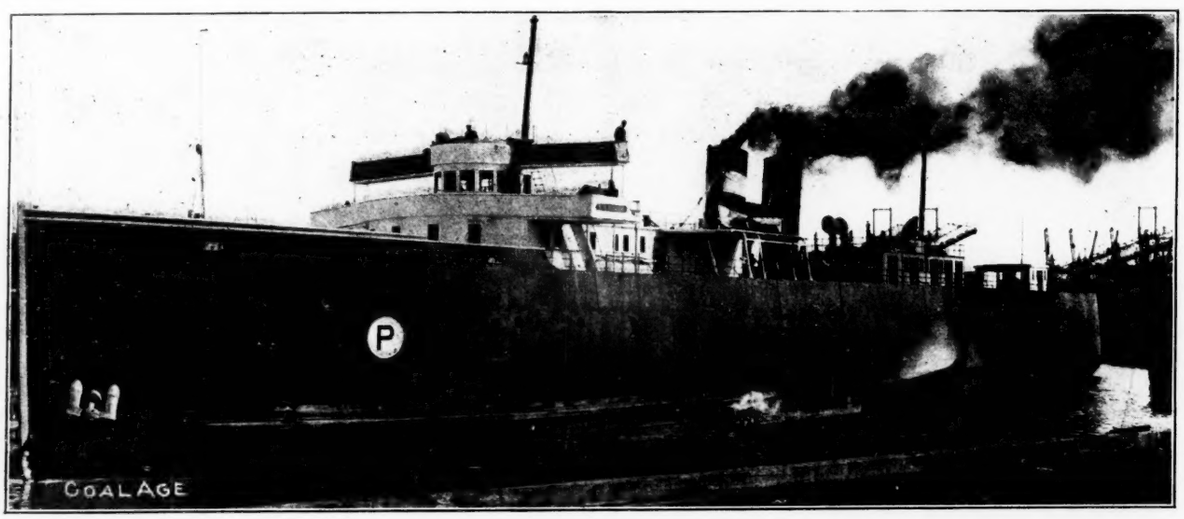
For some time after the opening of navigation to Lake Superior it is said that all the tonnage of that lake could be put into the hold of a single first-size freighter of today. There are now on the lakes about 1250 bulk freighters of cargo capacity running up to 15,000 tons and 225 passenger steamers, many of them also freight carriers, not to mention a host of small local craft and tugs. For a score of years Detroit has seen the largest fleet pass her doors of any port in the world. In the season of 1910, 25,578 vessels passed that port in 235 days, 160 in one day, the aggregate tonnage for the season being estimated at 75,000,000 tons.

The lake coal carrier and bulk freighter is now a strong, steel-clad seaworthy box, and such it is likely to remain indefinitely. The machinery has also about reached its maximum development. The triple-expansion engine and Scotch boiler came in quite a long time ago and efforts to supersede them have not succeeded. Power needed and crew required have not increased with the later increase of carrying capacity. With reference to the coal trade it should be said that the amount offering for shipment has not kept pace with the increase of tonnage and it is doubtful if it ever will again.



RAILROAD-CAR FERRY "ASHTABULA," WHICH MAKES TWO TRIPS A DAY OUT OF ASHTABULA, ACROSS TO CANADIAN PORTS

For a long time the main bar to the coal trade was the lack of storage capacity on the upper lakes, but that is increasing fast. For awhile the coal shippers tried to oblige consumers to buy enough in summer to keep the moderate-sized receiving docks moderately free during the active season, but they have about given that up as impracticable. People will buy when they want the coal and not much before that time. So when the shippers, especially of anthracite, have begun to erect vast storage docks at the chief upper-lake ports and it is now stated that a winter's supply can be laid down at more than one of these ports, if only a small percentage is shipped out before winter. The other ports are following.

But it is somewhat different with bituminous coal. The consumer is a more constant quantity than a railroad company or a manufacturer, with a large storage capacity. The amount of bituminous is, however, much greater than of anthracite, so that dock storage is in that case also, a large factor.

The Coal Output of Alaska

The production of coal in Alaska in 1912, as stated by E. W. Parker, of the U. S. Geological Survey, was 355 tons, valued at $2840, a decrease from 900 tons, valued at $7200 in 1911. The production in 1912 does not include the coal mined under the direction of the U. S. Bureau of Mines for testing purposes, which amounted to 900 tons, but, of course, no commercial value can be placed upon this coal.

A little coal was mined in Alaska prior to 1884 by the crews of vessels that ran short of fuel, but this probably did not aggregate more than a few hundred tons. The total output of coal prior to 1889, including that mined by the Russians, was probably less than 10,000 tons.

The 1912 Coal Production

The production of coal in the United States during 1912 reached the grand total of 534,466,580 short tons, valued at the mines at $695,606,071, according to the figures of E. W. Parker, of the U. S. Geological Survey.

In 1882, the first year for which statistics are available, the total coal production of the United States had reached what was then considered as about high-water mark, 103,551,189 short tons. In 1912, the production of bituminous coal in the State of Pennsylvania alone exceeded that figure by nearly 60 per cent. and the combined production of bituminous and anthracite in Pennsylvania was 2¼ times the total production of the United States in 1882, while the total production of the whole country for 1912 was more than five times what it was in 1882. The United States is at present contributing 40 per cent. of the world's supply of coal, and is consuming over 99 per cent. of all the fuel it mines.

In 1912, the production of coal in the United States not only passed all previous tonnage records, but the average value per ton exceeded that of any normal year in the 33 years for which statistics are available. There has been only one year when prices generally were higher than in 1912 and that was 1903, the year of a fuel famine.

The gain in output in 1912 over 1911 was 38,095,554 short tons, and the increase in value was $69,040,860. The production of bituminous coal increased from 405,907,059 short tons to 450,104,982 tons, a gain of 44,197,923 tons, with an increase of $66,607,626 in value. The decreased production of anthracite, amounting to 6,102,469 short tons was due entirely to the suspension of mining in April and May, when practically the entire region was idle.

Those factors which contributed to the increased output of bituminous coal were first the revival in the iron and steel industry, which stimulated production in the Eastern states, the coal made into coke alone showing an increase of nearly 6,000,000 tons; second, bountiful crops of grain and other agricultural products, which gave prosperity to the farming communities of the Middle West; third, decreasing supplies of natural gas and fuel oil in the Mid-Continent field and their consequent lessened competition with coal from the Southwestern states; fourth, increased consumption by railroads and in nearly all lines of manufacturing; fifth, activity in the mining and smelting of the precious and semi-precious metals in the Rocky Mountain and Pacific states.

Of the twenty-seven states in which coal mining may be considered to be conducted on a commercial basis, there were twenty-one in which the output of 1912 showed an increase over that of 1911, and in all but two of the important states the increase in value was greater than the increase in tonnage.

In the production of bituminous coal, Pennsylvania in 1912 showed an increase of 17,304,231 short tons. West Virginia's increase in 1912 was 6,955,107 tons. Illinois increased its production by 6,206,108 tons; Ohio by 3,768,741 tons; Kentucky by 2,440,818 tons; Indiana by 1,084,363 tons; Alabama by 1,079,179 tons; Virginia by 981,971 tons; Colorado by 820,441 tons and Kansas by 807,454 tons.

A Small Peat Production

While the United States is the richest country in the world in deposits of peat, little active work is being done in mining or digging it, and so far as is known, very few of the peat-fuel plants established have gone beyond the experimental stage, and many of them have never been equipped with essential machinery. Reports from all known peat-fuel plants in the United States, according to Charles A. Davis, in his Mineral Resources in 1912, show that with one exception they were idle during the summer of that year. The only plant reporting production made air-dried cylindrical peat blocks which, when thoroughly dry, were about six inches long and two inches in diameter, dense and hard and stood handling well. The output of peat fuel was reported as about 1300 tons, valued at $4550. All of this peat was sold.

The production of peat for fertilizer was, so far as reported in 1912, 41,080 short tons, of which about 8000 tons was reported as sold air-dried, that is, not dried by artificial heat. The value of this material at the selling prices reported was $186,522.

The amount sold for mixing with prepared stock feed was reported to be 3000 short tons, bringing an average price of about $6 per ton. An increased production of paper stock from peat fiber over that of 1911 was reported by the only company producing this material. The output for 1912 was reported to be 3000 short tons. The production of peat-moss stable litter in the United States in 1912, so far as could be learned, was suspended. As in past years peat-moss was imported from Holland, the importation last year being 9053 short tons, valued at $39,867, almost exactly the same as in 1911. This material is used almost exclusively as bedding for horses in stables in the thickly populated parts of large cities. It is especially adapted to this purpose on account of its absorbent and deodorizing properties.

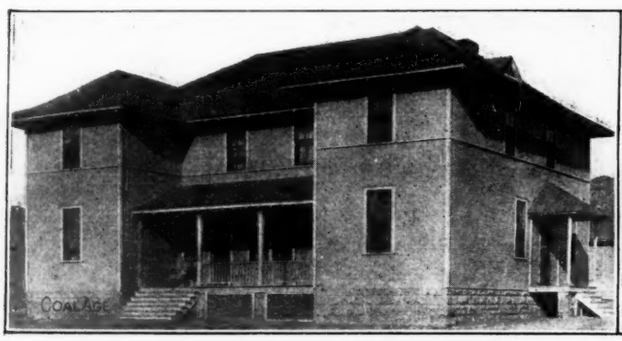
Natal Coal

According to the Daily Consular and Trade Reports, coal is the only mineral mined in Natal to any extent. The industry is at present in a better condition than during 1912, because of an agreement which was entered into among a majority of the operators to coöperate instead of acting independently, and which has resulted in higher prices. A difficulty in the way of great expansion in the near future is the inability of the Government to meet all demands of the operator for rolling stock to transport coal from the mine to the port.

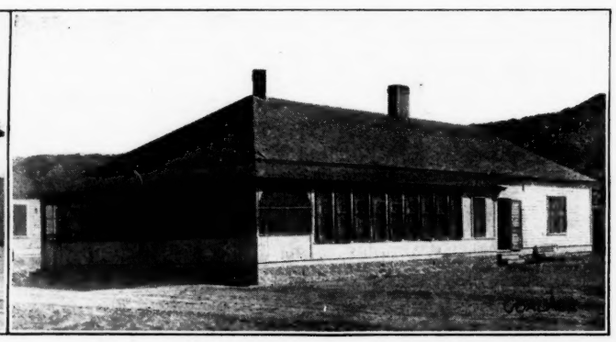
SNAP SHOTS IN COAL MINING

SAWING MINE TIMBERS, WHITE CITY, KY.

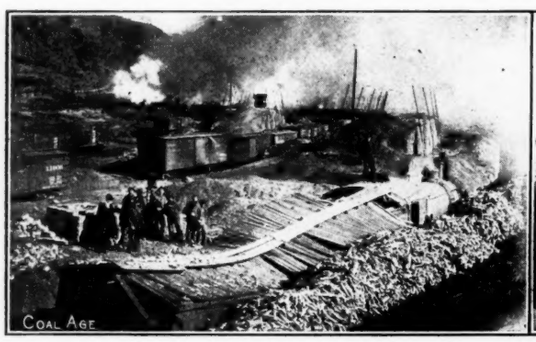
COLUMBUS COAL CO.'S CAMP, COLUMBUS, KAN.



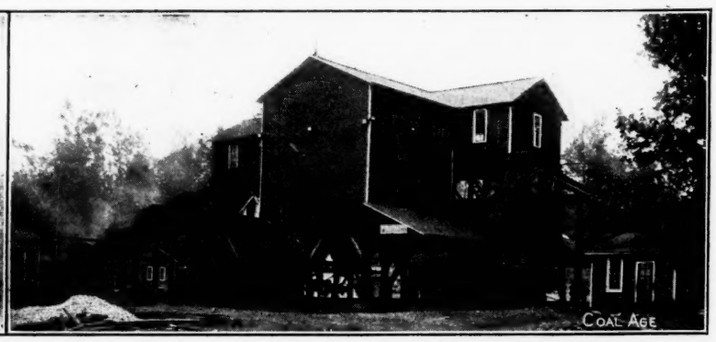
VICTOR-AMERICAN CO.'S HOTEL, HEATON, N. M.



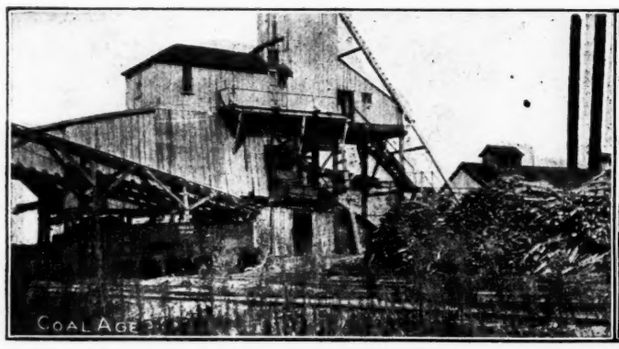
VICTOR-AMERICAN CO.'S HOSPITAL, GIBSON, N. M.

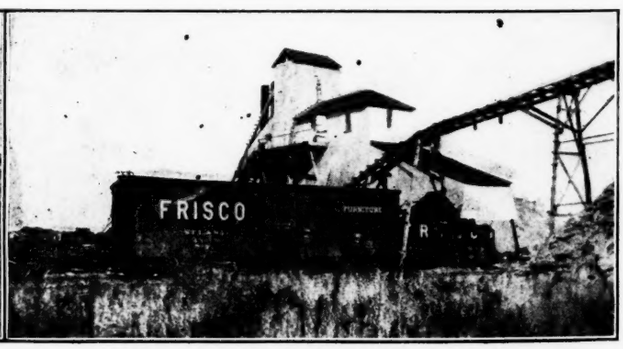


RUNAWAY LOCOMOTIVE, SUNNYSIDE, UTAH

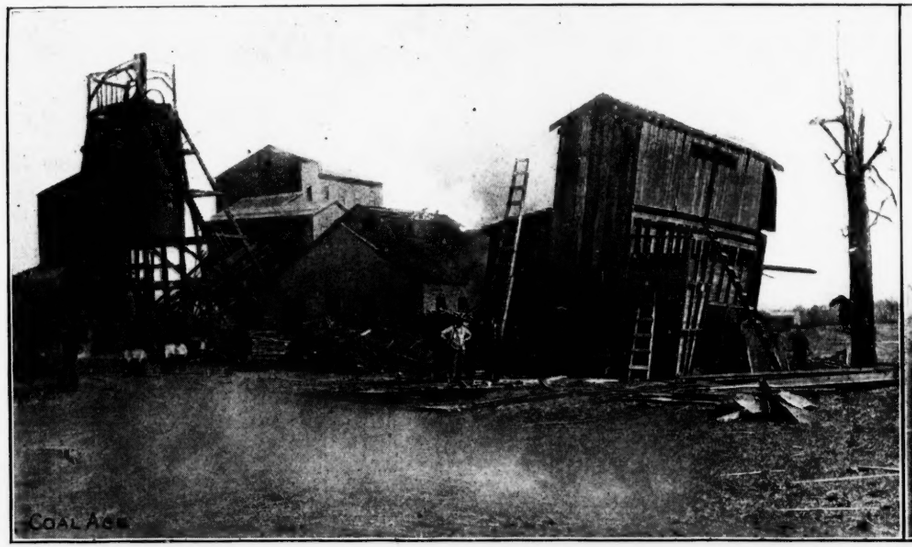


THE FOX RUN TIPPLE, ST. CHARLES, KY.

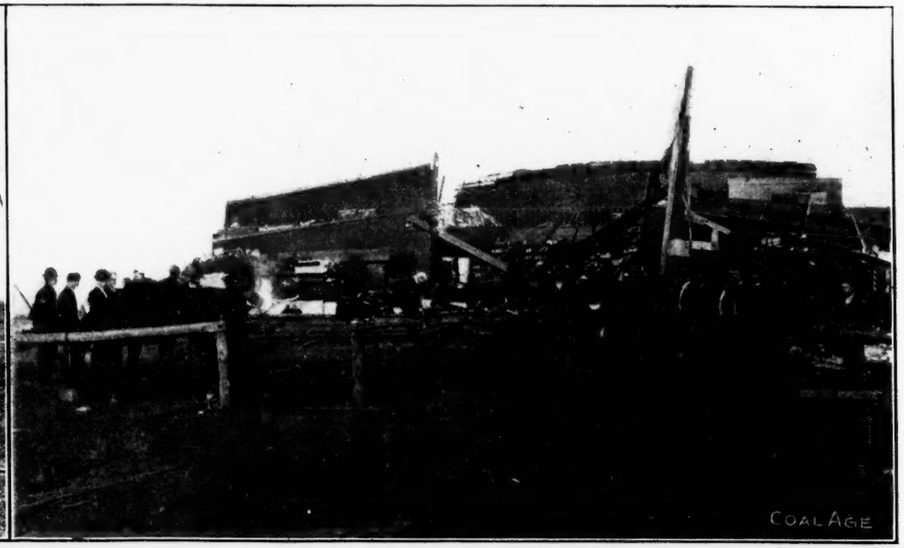




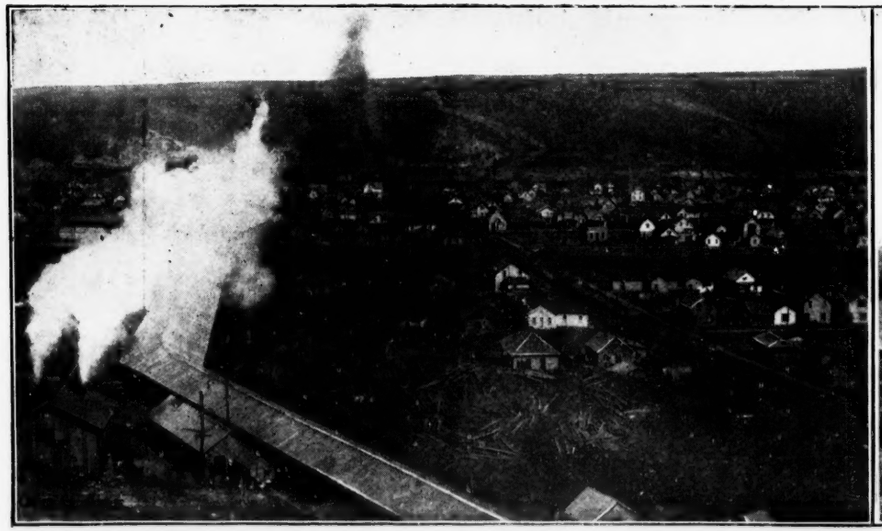
MINES NOS. 14 AND 15 AT CROWEBURG, KAN.



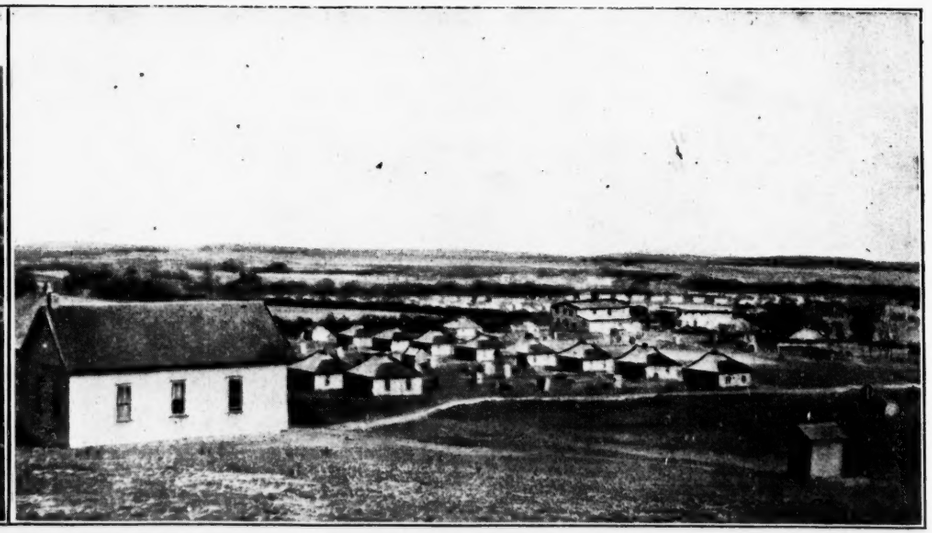
MINE NO. 1, BUSH, KAN., AFTER CYCLONE PASSED



WHAT REMAINED OF COMPANY STORE AT NO. 3 MINE



BIRDSEYE VIEW, LOOKING EAST, RED LODGE, MONT.



SHOWING CROWEBURG, KAN., FROM RESERVOIR HILL

Some Notes on Briquetting Methods

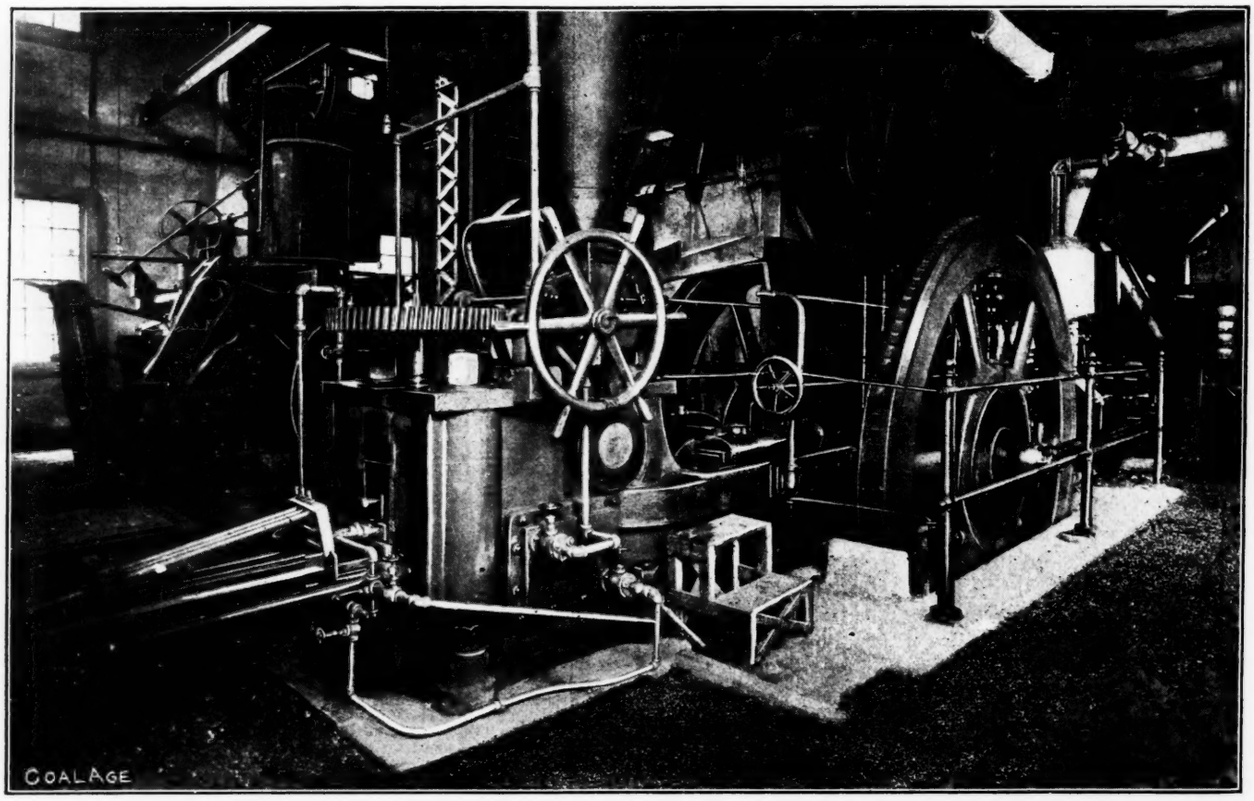
By C. L. Edholm*

SYNOPSIS—A few remarks on some of the results obtained in briquetting. The possibilities of briquetting are touched upon and some interesting photos given.

The low-grade Western lignites have only one redeeming quality—they are unusually cheap, having a value per ton at the mine of 90c. in Texas, $1.45 in North Dakota and $2.46 in California. Furthermore, there are enormous supplies of them, 150,000 square miles or so of our Western states contain deposits of lignite and the government owns millions of acres of such lands, probably because no one cared enough for them to take them up.

Briquettes have various advantages over the lignite as it is mined. By the drying, which is one of the processes of manufacturing, the heating qualities are tremendously increased. The elimination of moisture also makes for economy, in that the shipper does not have to pay for transporting so much useless water. The briquettes have been tested for both exposure to the weather and the rough handling, by dropping and revolving in a tumbler to show that they will stand transportation and storage.

Another advantage for household use is that the briquettes develop no offensive gases in burning, whereas the lignite has an unpleasant odor. They burn brightly



General View of German Briquetting Apparatus Showing Presses

With the advancing cost of high-grade coal the Bureau of Mines has turned its attention to the possibilities of this inferior product and the results have been highly satisfactory. Not only was a furnace developed on one of the Western reclamation projects which solved the problem of burning the lignite as it came from the mine, but experiments were made with foreign and American briquetting machines; these show that lignite can be compressed into excellent fuel, in some cases without the addition of a binding element to make the particles cohere. Where a binder is required, it has been found that sulphite-pitch, a product of the waste of paper mills, can be utilized to good advantage; this is a profitable discovery, inasmuch as the disposing of this waste material has been a serious problem in the past.

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with a yellow flame and the smoke is not black, like that of bituminous coal, but thin and yellowish. For many years such briquettes have been in use in Germany and the comparative cleanliness of Berlin and other German cities is ascribed partly to the use of this fuel.

The German and English Machines

A German briquetting machine and one of English make have been installed at the experimental station of the Bureau of Mines at Pittsburgh. Carloads of lignite from various parts of the country were shipped in and tested separately with widely differing results, but with a satisfactory average. It was found that lignite from each of the various states from which samples were received could be compressed into briquettes without the use of a binding material; but the manufacture of briquettes with

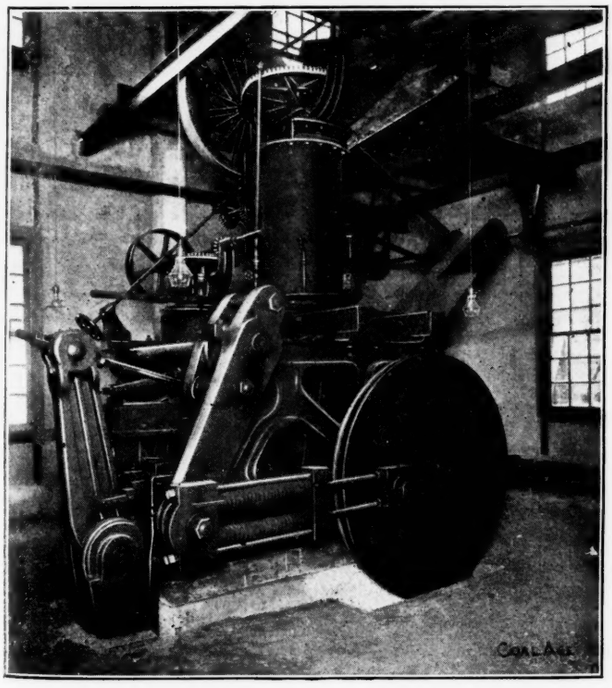
SAMPLES OF BRIQUETTES, SHOWING EFFECTS OF WEATHERING ON DIFFERENT TYPES

an addition of binding material, such as sulphide-pitch, coal-tar pitch, water-gas pitch, and some form of starch offered encouraging possibilities for further experiments.

The English machine was used for making briquettes with the addition of a binder, while the German apparatus was adapted for those made without such binding material. In addition to the experiments made at Pittsburgh, tests were made with a privately owned briquetting machine, of American make, operated by a fuel company in Indianapolis; the fact was here demonstrated that briquettes of good quality could be made of American lignite with a machine designed and constructed in this country.

Variously shaped briquettes are produced by the different machines, cylindrical, brick-shaped with rounded ends, and cubical, and they range in weight from one to three pounds. The surface is smooth and the best of them do not lose their glossy finish and sharp edges after exposure to the weather, although this varies greatly with the different fuels used. Combustion tests were made in a range and a heating grate with satisfactory results.

The cost of the manufacture of briquettes (in addition to cost of lignite) is estimated at from $1 to $1.72 per ton, according to the local conditions, cost of labor, etc.,



A GERMAN BRIQUETTING MACHINE

in the various states where lignite is mined. The cost of installation is placed at $56,000 for the German plant and between $18,000 and $19,000 for the English plant, the former producing 25 tons of lignite briquettes in a 10-hour day while the latter has a capacity of 38 tons in the same time.

American Coal in Sweden

There is great opportunity for American coal in Sweden, according to the Daily Consular and Trade Reports. The only difficulty to be solved is the question of freight. The shortcomings in this respect may be said to be all our own for the reason that we have no ships; and what is true of the coal situation is true in many other branches of trade.

Sweden imports something like $16,000,000 worth of coal annually, chiefly from England. American coal producers could have half of this trade if they could free themselves from English domination in the question of tonnage. The chief obstacle that American coal merchants have to contend with today in shipping coal to Mediterranean countries and to South America is not the price or quality of the fuel, but purely and simply the ability of English ship owners to raise or cut the price of coal freight at will, or as suits their purpose in controlling these markets.

How much more difficult is it therefore to pass by England to the Swedish market? Sweden is dependent at present upon England for coal, at the same time the country's state railways and industries are entirely at the mercy of strikes in England, which fluctuate the market and even jeopardize many manufacturing plants by threatening coal famines. Swedish manufacturers would gladly free themselves from such conditions by importing American coal if they were able to do so.

Coal in North Manchuria

The only coal mine in operation in North Manchuria, according to the Daily Consular Report, is located at Djalainor, near Manchouli. It is owned by the Chinese Eastery Ry. and leased to a Harbin capitalist under agreement to supply coal to the Chinese Eastern Ry. at 70.8c. per ton, and to the Trans-Baikal Ry. at $2.266 per ton, delivered to Manchouli.

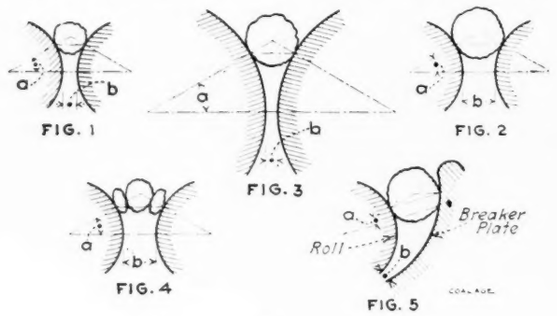
During 1912, the Chinese Eastern Ry. took 142,880 tons, amounting to $101,159, and the Trans-Baikal Ry. 35,720 tons, at $80,942. The sales of coal from the Japanese mines in Fusan have greatly increased during 1912, the principal consumer being the Chinese Eastern Ry.

A New Single-Roll Crusher

A patent was recently issued to the Jeffrey Mfg. Co., of Columbus, Ohio, for a new type of single-roll crusher. This promises to be of considerable value to coal producers, since it embodies a practical machine capable of reducing run-of-mine coal to stoker size in a single operation.

The double-roll crusher, heretofore generally used for such work, is limited in its scope by the following considerations. Fig. 1 shows a pair of smooth rolls acting on a lump of material lying between them. Such rolls will not pinch the lump unless the angle *a* becomes less than the angle of repose of the material. Roughening the surface of the rolls, or providing them with tooth projections, will, of course, increase the angle of repose, and hence enable the rolls to grip larger pieces than would be otherwise possible.

Fig. 2 shows how, with the same rolls, larger pieces



THE ACTION OF DOUBLE-ROLL AND THE NEW SINGLE-ROLL CRUSHER

may be handled by simply placing the rolls farther apart. This, however, leaves a larger gap between them, and hence the product will contain larger pieces.

Fig. 3 illustrates how, by increasing the diameter of the rolls, larger pieces of material may be handled without increasing the gap. The rolls here shown would handle as large pieces as those in Fig. 2, and reduce them to the same size as those shown in Fig. 1. For hard, tough coals, like Indiana block, the gap must be brought down to the size desired in the product. For soft, friable coals, like Pocahontas, a slight pressure on the side of the lump will result in reducing it to small pieces.

Fig. 4 shows how two or three pieces of such coal may become wedged in a wide gap, and all be properly reduced. Consequently, crushers handling very soft coal may be run with a wider gap, and will have a correspondingly greater capacity than will obtain with the same crusher operating upon a tougher material.

Fig. 5 shows how the new single-roll crusher with concave breaker plate is able to diminish the pressure angle, and thus reduce the larger lumps to a smaller size than would be possible with any two-roll crusher.

The face of the drum is covered by renewable iron segments. Fig. 6 shows these segments to be covered with a system of tooth projections of three different sizes and shapes, whose office will be readily understood. If the breaker plate is so set that the gap between it and the drum be of a certain width, it is evident that all coal passing through this gap must be reduced in one of its dimensions to this size. The coal, however, may come through in large slabs of this thickness.

TEETH ARE REQUIRED ON THE DRUM

The friction of the coal on the breaker plate will be more than the traction of the drum, hence the numerous hook teeth shown in Fig. 6. These teeth should be far enough apart to engage the coal between them, and must not extend radially from the drum farther than the width of the gap. Spaces exist roughly in the form of squares inclosed between the various teeth, which will contain slabs of coal not thicker than the gap. In order to break these slabs up pyramidal teeth are placed in the center of the squares formed by the hook teeth. We now have a combination of projections that will reduce whatever may pass through the machine to a product not larger than the gap.

The retarding action of the breaker plate is, however,

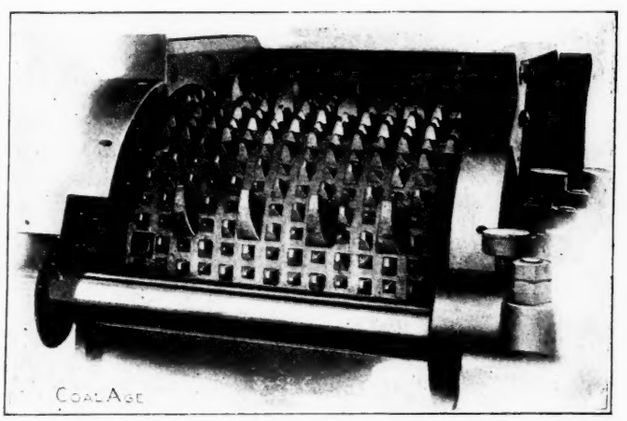


FIG. 6. ARRANGEMENT OF TEETH UPON ROLL

so great that the machine will not readily grip large pieces. Hence a set of large thin hook teeth are placed at intervals around the drum, and narrow grooves are cut in the breaker-plate shoe to clear them. These serve the purpose of engaging the larger pieces and breaking them up, or forcing them through the machine without passing any material which has not been reduced to the required size.

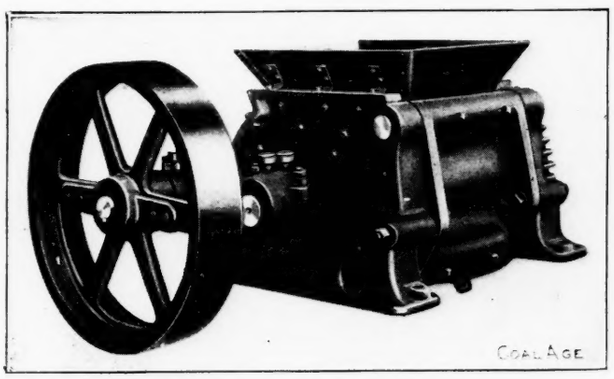
The degree of reduction to be had with any size of this crusher depends in a great measure on the adjustment of the breaker plate. This is also affected, however, by the character of the coal. A soft, friable coal will, under similar conditions, split into smaller pieces than harder and tougher varieties.

The capacity of these crushers depends on the size of the product, the speed of drum rotation, and the friability of the material. The power required to operate when making a fine reduction will vary with the kind and condition of the coal reduced, but will average about one-third horsepower per ton per hour. These machines are manufactured in three standard sizes, namely, 30x30 in., 24x24 in., and 18x18 in. The larger size will handle any coal up to 20-in. cubes, while the smaller takes lumps up to 8 in. They are primarily built for belting to an electric motor, and this appears to make the most desirable installation whenever possible. The heavy band-wheel carries the machine over the peak loads and makes a smooth, quiet-running equipment. When desired, however, a geared-motor drive is substituted for the pulley and belt, with quite a saving in room where space is valuable.

Each machine is provided with a self-contained countershaft, which drives the roll through a pair of heavy gears, thus giving so heavy a starting torque that it may readily be put in motion even when the machine is full of coal. In many cases this is a great advantage, as coal may be received directly from a large hopper or bin without any auxiliary feeder.

An Efficient Safety Device

The belt wheel is not keyed directly to the countershaft, but drives it through a hub, over which it is fitted. This hub has a pair of radial arms, so attached to the arms of the band wheel, that a system of wooden pins serve to make the driving connection between the two. When any undue strain comes upon the drive, as by a piece of steel or other foreign material getting into the throat of the machine, these wooden pins shear off, and



General View of Crusher

thus prevent injury to the more important parts of the mechanism.

The breaker plate is heavy, and is lined with a hard iron renewable shoe. It swings on a top pivot, and is held up to its adjustment by steel tension rods. The nuts for this adjustment are conveniently located and accessible at all times, and the adjustment for position of the breaker plate may hence be varied if desired, even while the machine is in motion. The springs under the adjusting nuts are heavy enough to resist the action of the crusher when doing ordinary work, but sufficiently elastic to allow the breaker plate to give way slightly when abnormal strains come upon it. This allows the stress to come gradually upon the wooden safety pins until the load is more than they can stand, when they give way.

Throughout the design and construction of these machines durability and accessibility have been considered constantly of prime importance. All parts have been so constructed that they will not only wear well, but may be easily and quickly replaced, should occasion such as the failure of a plate or segment, demand their renewal.

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The quantity of air circulating in a mine should be measured at the foot of the downcast or at the main intake and, also, at the foot of the upcast or in the main return, at least once each week, and the quantity recorded in the mine-report book. The quantity of air passing in the last crosscut, in each split, should also be measured, so as to ascertain that a sufficient quantity of the air reaches the men.

Transporting Coal through Pipe Lines

The method of transporting coal by water pressure through a pipe has been suggested by E. G. Bell, engineer for the Hammersmith Electricity Works of London. By this method from 30 to 60 tons of coal per hour can, it is claimed, be forced through an 8-in. pipe leading from the Thames and under Chancellors' Road to the yard of the power plant on Fulham Palace Road, a distance of 600 yards.

If the scheme is adopted, a large mixing tank will be erected beside the wharf. The coal will be lifted from the barge by a mechanical grab, and after passing through an automatic weighing machine, it will be filtered into the mixing tank, which will contain approximately 15 per cent. of coal and 85 per cent. of water. A powerful electrically driven pump will then force the mixture of coal and water at high velocity through the transmission tube to a reception tank at the works.

The coal will sink to the bottom of this tank and another pump will drive the water through a return pipe to the mixing tank. Another grab will lift the coal out of the reception tank into the storage yard.

Although the initial cost of such a plant might be high, it is believed that it would eventually be a paying investment, since the present cost of transportation is approximately 14c. per ton, or somewhat over $3500 for the 25,000 tons which are used annually.

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Coal Consumption of the Iron Industry

The production of pig iron by means of bituminous coal and coke amounted in the first half of 1913 to 16,075,264 tons or 97½% of the total, according to the American Iron & Steel Institute. The amount of mixed anthracite and coke iron was 225,665 tons. The production with anthracite coal alone was 11,491 tons, and the production with charcoal was 176,182 tons, including a small quantity made with charcoal and electricity.

The production of iron by the various fuels for whole years since 1877, in which year the total production first exceeded 2,000,000 tons, is herewith shown.

	Anthracite	Charcoal	Bituminous and Coke	Total
1877	834,640	283,789	948,165	2,066,594
1878	975,777	261,963	1,063,475	2,301,215
1879	1,136,629	320,422	1,284,802	2,741,853
1880	1,613,974	479,963	1,741,254	3,835,191
1881	1,548,627	570,391	2,025,236	4,144,254
1882	1,823,338	623,130	2,176,855	4,623,323
1883	1,683,568	510,469	2,401,473	4,595,510
1884	1,416,476	409,301	2,272,091	4,097,868
1885	1,298,562	357,004	2,388,960	4,044,525
1886	1,874,640	410,319	3,398,370	5,683,329
1887	2,087,847	516,234	3,813,067	6,417,148
1888	1,719,401	534,633	4,235,704	6,489,748
1889	1,714,602	575,268	5,313,772	7,603,642
1890	2,186,411	628,145	6,388,147	9,202,703
1891	1,866,108	576,864	5,836,798	8,279,870
1892	1,797,113	537,621	6,822,266	9,157,000
1893	1,347,529	386,789	5,390,184	7,124,502
1894	914,742	222,422	5,529,224	6,657,388
1895	1,270,899	225,341	7,950,068	9,446,308
1896	1,146,412	310,244	7,166,471	8,623,127
1897	932,777	255,211	8,464,692	9,652,680
1898	1,203,273	296,750	10,273,911	11,773,934
1899	1,599,552	284,766	11,736,385	13,620,703
1900	1,677,048	384,482	11,727,712	13,789,242
1901	1,712,527	383,441	13,782,386	15,878,354
1902	1,115,247	390,169	16,315,891	17,821,307
1903	1,911,347	505,684	15,592,221	18,009,252
1904	1,228,140	337,529	14,931,364	16,497,033
1905	1,674,515	352,928	29,964,937	22,992,380
1906	1,560,586	433,007	23,313,498	25,307,191
1907	1,371,554	437,397	23,972,410	25,781,361
1908	355,009	249,146	15,331,863	15,936,018
1909	698,431	376,003	24,721,037	25,795,471
1910	649,082	396,507	26,257,978	27,303,567
1911	229,575	278,676	23,141,296	23,649,547
1912	247,179	347,025	29,132,733	29,726,937

Twelfth International Geological Congress

By Phillips Thompson*

SYNOPSIS—The congress has signalized its Toronto meeting by the publication of a monumental book on the Coal Resources of the World. This monograph contains the cheering information that there are seven trillion tons of coal awaiting the miner. The delegates seemed to think that the chemists should no longer be allowed to classify coals but that such fuels should be examined microscopically in order to determine their petrographic characters for the purposes of classification.

The Twelfth International Geological Congress began its sessions on Thursday, Aug. 7, in the Convocation Hall of the University of Toronto, Toronto, Can. About 500 delegates, speaking 25 different languages and coming from all parts of the world, were in attendance. The formal opening meeting was held at noon. Sir Charles Fitzpatrick, administrator of the Canadian government in the absence of the Duke of Connaught, welcomed the delegates on behalf of the government. In his address, which he delivered in French, he called the attention of his auditors to the many features of special geological interest in Canada, including the Laurentian plateau, the nickel, silver and gold deposits of Ontario, and the extensive coal beds of Saskatchewan and Alberta. Addresses of welcome were also delivered by A. W. Hearst, Ontario Minister of Mines, Controller Thomas Church, representing the city of Toronto; and President Falconer, of the University.

The newly elected president of the Congress, Dr. Frank D. Adams, of McGill University, Montreal, then took the chair and briefly thanked the Congress for the honor conferred upon him. R. W. Brock, of the Canadian Geological Survey, addressed the Congress, stating that the Executive Committee had arranged excursions so that the delegates might have the opportunity to visit localities of special geological interest. The excursion routes arranged covered a total distance of 20,000 miles. Dr. Emil Tietze, of Austria, replied on behalf of the delegates.

An Encyclopedic Record of Coal Reserves

At the afternoon sitting, over which T. Tschernyschen, director of the Russian Geological Survey, presided, R. W. Brock formally presented to the Congress the elaborate monograph on the "Coal Resources of the World," the result of an investigation made on the initiative of the Congress. It is intended to form a companion work to the "Iron Ore Resources of the World," published under the auspices of the Eleventh Congress, and consists of three quarto volumes, containing in all 1360 pages, illustrated by upward of 175 maps and figures and accompanied by a 68-page atlas of maps, colored so as to show geologic features.

The preparing and publication of the monograph was entrusted by the Executive Committee to a Coal Resources Committee, consisting of G. G. S. Lindsey, Convenor; F. D. Adams, R. W. Brock, D. B. Dowling, Charles Fergie, James McEvoy, J. B. Porter and William McInnes, and the actual editing was done by William McInnes, D. B. Dowling and W. W. Leach, of the Geological Survey.

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In the main body of the monograph, reports on 64 countries are included, some of which contain over 100 pages. The greater number of the reports are in English; ten are in French and six in German. In the "summary," which appears in the first volume, all the reports are reviewed by the editors, in English.

Coal Classification

Owing to the lack of uniformity in the usage of the different countries of the world in regard to the commercial classification of coals into anthracite, bituminous coal and lignite, it was found necessary to adopt an arbitrary classification which might be used by all and thus make the results more easily comparable. The Coal Resources Committee drew up a scheme of classification, dividing the coals into A, B, C and D groups, with various subdivisions, based mainly on composition and heating value. In this scheme A roughly corresponds to anthracite, B and C to bituminous coal and D to subbituminous coal, brown coal and lignite.

With few exceptions, the reports submitted conform to the classification prescribed as they do also to the other requirements regarding the depths to which computations were to be carried and the division of the reserves into actual, probable and possible reserve, though in some cases the information at hand has not been full enough to warrant strict compliance with the specified form on all these points.

The Geological Range of Coal Beds

In the introduction, Mr. Dowling summarizes the results, dealing first with the distribution of coal in the various geological series. The range of important fields in the Paleozoic extends from Lower Carboniferous, in the case of the fields of Central Russia, Scotland and the Arctic Islands through Upper Carboniferous, to which the large deposits of Western Europe and Eastern America appertain, to Permo-Carboniferous, in which are embraced most of the very extensive fields of China, India and Australia. The Mesozoic, though not so widely spread, contains important coal basins in Europe, Western America and Asia. The Tertiary contains deposits of importance in most parts of the world, including fields in Central and Western Europe, in Japan, in New Zealand and throughout the great plains region of North America.

Seven Trillion Tons of Coal

The total reserves of the world, compiled from all the reports received, amount to 7,397,533 million tons, of which nearly 4,000,000 millions are bituminous coals, nearly 3,000,000 millions are brown coals of various grades and nearly 500,000 millions are anthracite coals. Of the latter, Asia, which includes the great Chinese coal fields, has by far the largest supply of any of the great continental divisions, furnishing 407,637 million tons; in bituminous coals America, with 271,080 million tons, leads by a great margin, as she does also in the various grades of brown coals. The world's production of coal for the year 1910 was about 1145 million tons, so that, though much must be allowed for loss in mining, and for areas that for various reasons cannot be economically mined, there still remain many hundreds of

years before the exhaustion of the supply will occur. Taking up the individual countries, however, it is found that in more than one case the end is in sight.

Chemist versus Petrographer

An interesting discussion followed the presentation of the monograph. J. M. Gordon, of Montreal, objected to the method of classification of coal adopted in its preparation. He urged that there was no certain significance in the relation between fixed carbons and volatile matter. Many attempts had, he said, been made to classify coal, but there is no classification today that can be said to have any degree of accuracy. The classification by length of flame was only comparative. No division into classes by chemical analysis was possible, and the quality of coal could only be determined with a microscope.

A. Defline, of Paris, gave a paper setting forth in detail the coal resources of France. Professor Krusch, of Germany, read a paper prepared by Mr. Bokar, upon the subject of classification. The writer maintained that an ideal division into classes was not possible, because enough was not known about the genesis of coal and the chemical changes through which the original vegetation passed after deposition.

A. E. Kitson, of the West African Gold Coast Survey, gave an interesting description of the brown-coal deposits of Victoria, which attain the extraordinary thickness of from 808 to 1110 ft. He was disposed to agree with Mr. Gordon as to the unreliability of present methods of classifying coal as the character of the fuel depends largely on its origin. The Congress disbanded on Aug. 14.

The Illinois Mining Board

The following resolutions were passed at a recent meeting of the Illinois State Mining Board, held at Springfield, as a tribute of high esteem and respect for the former president of the board, Richard Newsam, who died Aug. 5, 1913:

Whereas, it has pleased an allwise Creator to remove from our midst Richard Newsam, who for a number of years was the president of the State Mining Board; and

Whereas, by his ability and honesty the stand and efficiency of the State Mining Board and state mine inspection service has been raised until we are second to no similar board in the United States of America; and

Whereas, the deceased, by his wide knowledge of mining matters, practical and theoretical, and his aptness and ability in imparting such knowledge to all who were seeking the same, was a valued and competent presiding officer of the State Mining Board; therefore be it

Resolved, that we pay a just and fitting tribute to his ability and memory when we mourn for him as one in every way worthy of our respect and esteem.

Resolved, that we sincerely condole with the widow and family of the deceased, and commend them to the keeping of Him who looks with tenderness on the widow and fatherless.

Resolved, that these resolutions be spread on the records of the State Mining Board, and that copies of the same be forwarded to the widow of our late friend, to the newspapers and mining journals of the state, and that the same be made a part of the thirty-second annual coal report.

STATE MINING BOARD:
Evan D. John, Actg. Pres.
Martin H. Linskey, H. E.
S. M. Duggan, Secy.
Wm. Spenny, Member.
Martin Bolt, Chief Clerk.

STATE INSPECTORS OF MINES.

Hector McAllister,	1st	Dist.
Thomas Hudson	2d	"
John Dunlop,	3d	"
James Taylor,	4th	"
W. S. Burris,	5th	"
Thomas P. Back,	6th	"
W. W. Williams,	7th	"
W. L. Morgan,	8th	"
Walton Rutledge,	9th	"
Thomas Little,	10th	"
Frank Rosbottom,	11th	"
J. W. Fairbairn,	12th	"

A Mining Class

One of the most practical examples of the effective instruction given by many mine foremen to their employees, is that of Foreman Evan W. Evans, mine foreman of the Capouse Colliery of the Scranton Coal Co. Mr. Evans was formerly (1896) one of the brightest students in the Y. M. C. A. mining class, taught by J. T. Beard, at Scranton, Penn. Since that time, Mr. Evans has continued his mining studies and has performed many practical experiments in the application of theory and principles to mining practice. He has prepared and read many interesting papers on subjects of mining.

We are glad to be able to reproduce here a recent photograph of a mining class, organized and conducted by

The Evans Mining Class

Mr. Evans, as an evening school. For two years this class was conducted at the Evans home, until its increasing numbers required larger accommodations. Through the generosity of the School Board, permission was obtained to hold the class twice a week in one of the classrooms of No. 18 school. This class is attended by earnest, hard-working mining men, who are making every effort to better their own conditions and secure greater safety in the mines, for themselves and their fellow workers, by increasing their knowledge of mining principles, and conditions. The regular attendance upon the sessions and the work performed by the class show the appreciation of the men for the disinterested efforts of their foreman, who receives no pay for his services other than the hearty good will of the men.

The members of the class represent all grades of workers in and about the mines, including hoisting engineers, firebosses, "nippers," timbermen, tracklayers and miners. Their ages range from 25 to 50 years. One of the practical features of the class is the illustration of the principles taught by practical experiment. The example of this faithful mine foreman is worthy of emulation by others who are capable and in a position to give instruction to mine workers, along similar lines. The class and its conductor have the best wishes of Coal Age for the success of their efforts.

POWER DEPARTMENT

Purchase of Electrical Apparatus

By Henry D. Jackson*

SYNOPSIS—Simple suggestions are here given concerning the details of construction and installation of electrical machines and switchboards. The selection and placing of indicating instruments receive particular attention.

In purchasing alternating-current generators, it is advisable to examine carefully all constructional details, particularly with reference to the methods of insulation and the windings of fields and rotors, as well as the manner of applying the exciting current. The windings of the rotors are especially important with direct reference to the ease of repair and the means of fastening the coils in place in the slots, as well as securing their ends against the effects of short-circuit. The field coils should be examined for methods of fastening in place to prevent the possibility of movement and also with regard to ease of replacement.

The flywheel effect on alternating-current machinery is of considerable importance, particularly when it is necessary to operate generators in parallel, as the combined flywheel effect of engine and generator must be large in order to insure a constant turning moment. It is advisable that the turning moment of all machines should be practically the same, so that there will be no interchange of current between them when they are operated in parallel.

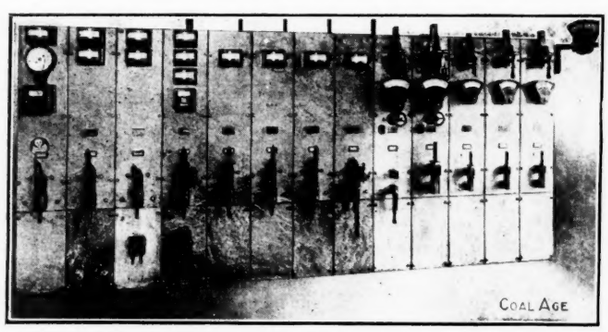
In most mine work it is not advisable to have a generator of inherently good regulation, in fact, it is better to have one of rather poor regulation, because in case of short-circuit, the machines, having a high self-induction, will prevent current reaching any excessive value. If good voltage regulation is absolutely necessary or desirable, this can be obtained through the use of a Tirrell or some other regulator.

Temperature guarantees are of extreme importance, and figures should be obtained at unity, at 80 per cent. and at or about the power factor at which the plant may be expected to operate. This figure in many cases is low. There is, however, no reason why, with a proper design of the plant—by which is meant the entire outfit, generators, motors, rotary converters, etc—the power factor should be low; and for the best interests of the owners, care should be taken to keep this figure as high as possible in order to get maximum output from both engines and generators, and thus decrease the operating costs of the plant.

Twenty-Five Cycles Is Best for Mine Work

For mine work, a frequency of 25 cycles is to be recommended, principally owing to the greater stability of the rotaries and synchronous motors at this frequency, particularly if the former supply direct current at over 500 volts. The usual practice calls for three-phase transmission, and this is for general purposes by far the best. There are plants at present installed using quarter-phase, but as the amount of copper used by the transmission line is thereby considerably increased without any compensating gain, it is not to be advised.

Attention has already been called to the fact that for voltages up to 13,200 it is probably as satisfactory to purchase generators which will produce this voltage direct, as it is to use lower-voltage generators and step-up for the line. Machines of this character are perfectly reliable; and by purchasing them one will be relieved of the necessity for the use of step-up transformers with their additional cost. Above this voltage, however, owing to the increased cost of construction, it is



A Well Designed Switchboard

probably better to buy generators which will give a lower voltage, and step-up through transformers to the potential of the line.

The voltage at which to generate would depend upon a number of considerations; but is is usually kept low enough so that it may be carried direct to the board, if desired, without danger. It may be noted here that in case it is desired to run the generators in parallel, the engines should be provided with a device operating on the governor, by which their speed of rotation can be controlled.

This device is used for paralleling the machines and also for their control when it is desired to divide the load between them and to drop one out of service, since the generators of this character do not divide their load in proportion to the voltage generated but in proportion to the power delivered by the prime mover. This condition has not infrequently been lost sight of and has been the cause of considerable difficulty in operating generators satisfactorily in parallel. For the same reason it is advisable to watch closely the type of engines purchased, in order to see that they too operate with reasonable uniformity.

The above outline will show the necessity for a thorough knowledge of the strength of materials, the conditions of operation, and the features of design both of the engines and generators, in order to be certain that

*88 Broad St., Boston, Mass.

the best types of both are selected for mine service. In purchasing motors or rotary converters, the same general characteristics have to be taken into account as in buying any other A.-C. apparatus, the principal features being a careful examination of the materials and methods of construction, and the ease of repair.

Material and Arrangement of the Switchboard

The switchboard may be of slate or marble, depending upon the voltage employed, and also whether or not it is desired to make a "show" plant. For all practical purposes with voltages up to 500 or 600, a well selected slate board is quite as good as marble, and has the advantage of being considerably cheaper and far easier to keep neat. Above this voltage, owing to the possibilities of metallic veins in the slate, marble is to be preferred.

For the best results and for ease in adding future sections, the slate or marble should be supported on pipe framework, as this is cheaper, stronger and more readily handled than angle iron. In laying out the switchboard, it is usually advisable to figure on the future, because it is necessary for the best results in operation that the panels of similar character should be bunched together, that is to say, generator panels should all be in one line, the exciter panels in another, and the line panels in another, each set complete in itself, making, however, one continuous switchboard.

This can be secured by leaving blank places for future generator and line panels, and installing the exciter panels at one end of the board and the line panels at the other, leaving those for generators between. If it is desired, as it frequently is, for purposes of record, to have a totality panel or one on which all the power generated can be recorded, this can readily be inserted between the generator and line, and upon this panel can be installed, if desired, the power-factor meter, frequency indicator and synchronizing device.

With direct-current switchboards, the same reasoning holds true. For best results in operation, the generators should be bunched on one end of the board, and the line bunched on the other end, here again using, if desired, a totality panel between the two.

In direct-current work, owing to the fact that the main leads are usually carried direct to the board, it is more or less frequently necessary to work behind it, and consequently sufficient room should be left for easy working with the necessary tools, without danger. This means that the board should be at least 2 ft. and preferably 4 ft. from the wall.

The Instruments Required

The instruments required on a direct-current board depend upon the information which may be desired; but in general it may be stated that an ammeter is all that is necessary for the generator panel, provided that a voltmeter is so located as to be available for this generator and future installations. It is, however, not unwise to install a voltmeter and an ammeter on each generator panel, arranging the voltmeter so that it can be plugged to the generator, and another instrument on a swinging bracket which will show at all times the voltage on the main bus. In this way there is always a voltmeter showing the condition of the line and at hand another which will show the voltage on the generator as it is being built up ready to be put into service. This will enable the machine to be put into service promptly and accurately without any unnecessary plugging. It will also serve to prevent the throwing on to the line of a generator, in case the machine happens to be reversed by any accident. This is only true, however, in case the voltmeter used is one having a marked polarity, so that there is no danger of its indicating the voltage in case the machine happens to be reversed, as would be the case if the voltmeter were of the solenoid type. Where a single generator is used, the recording wattmeter, if one is installed, should be placed upon the generator panel.

Other Instruments Are also Advantageous

Another instrument which frequently serves a good purpose is a ground detector, as this will enable one at any time to discover whether or not the line is grounded. In mine work it is not infrequent to find grounds which, while not being excessive, might still be the cause of considerable leakage and, therefore, lost power which may eventually cause a station blowout with more or less disastrous results.

Another device of value is a switch whereby a voltmeter may be connected to various points upon the system, enabling the operator at the station to determine at any time the condition of the transmission line as to whether or not the drop over it is too great for successful operation of the machinery. If this voltmeter is connected at times of heavy load to various sections, the condition of the line can be readily obtained accurately without calling in outside assistance, and may serve to prevent considerable trouble with the mining machinery. It will also obviate the necessity for sending men into the mine for making these tests, which, while giving an indication, are by no means satisfactory owing to the possibility of the readings being taken at different intervals.

It is neither wise, nor good practice, to rely upon inferior instruments on the switchboard. They may be cheap in first cost, but are usually expensive in the end, first, because they are not accurate, and second, because the current required to operate them will in less than a year frequently cost much more than the interest charges on the difference between their cost and that of better-quality instruments.

Use Switches of Ample Capacity

Each machine should be provided with main switches of ample capacity and also with a switch connecting the equalizer. This latter may or may not be at the board. If the run from the switchboard to the generator is long, it is cheaper and on the whole frequently far more satisfactory in operation to have the equalizing switch at or near the generators, although there are reasons for objecting to this, particularly if the employees about the station are not careful men. The objection is that a three-pole switch on the generator will insure that the equalizer switch be closed when the main line is closed. If, however, the equalizer switch is at the machine, it is not uncommon to find that the operator forgets to close it, with the result that one or both machines may drop out of circuit or that there will be great and sudden fluctuations in voltage at the two machines.

The switches should be of ample capacity for the service. There is frequently a tendency to buy switches having a small copper section, on account of the cost.

A little thought will show that those switches having a small copper section, have a comparatively high resistance. This resistance will cause a loss of power, and this loss over a switch of high resistance as compared to one of low resistance, may be sufficient to much more than pay for the difference in cost of the two switches. Further, the heating may result in melting out the contacts back of the board and shutting down the station. Small switch area also means small contact area, which has a similar effect, and, therefore, it is unwise to attempt to economize along these lines.

Use Two Circuit-Breakers

A circuit-breaker should be installed on both line and generator, though frequently the latter is neglected, if the line breaker is particularly adapted to the service rendered. It is, however, a safety feature well worth keeping in mind, to place these breakers on the generator, as mine loads are greatly fluctuating, "shorts" are not uncommon, the line breaker may "hold over" and on a heavy short the generator, unless protected by a circuit-breaker, may be burned out. Attention should be paid to purchasing breakers whose continuous capacity is sufficient to carry the heaviest steady load which is ever likely to come upon them, and to operate the plant with the breakers set at the highest possible *safe* point. It is cheaper to have the breaker blow than to burn out the machine.

In this connection it is worth while to note that a delayed-action circuit-breaker is better than a breaker set to a danger point. Mine overloads and peaks are usually sharp and sudden, but not long lived, and a load may come instantly which is not beyond the capacity of the generator for the time it may be on, but which might readily throw the breaker if it is not provided with some means for delaying the trip. This can be accomplished by the use of dash-pots or other means. Attention to details of this character will insure contunity of operation is cases where the plant would otherwise be shut down temporarily.

Coal Production of British Columbia

British Columbia stands second among the Canadian provinces in the production of coal, and third in the manufacture of coke. The Coast District produced 1,533,000 tons of coal in 1912, the West Kootenai District, 1,299,000 tons, and the Boundary District, 214,000 tons.

Small Steam Turbines in Coal Mines

Special Correspondence

The increased use of alternating current at collieries has brought the small turbo-generator into considerable prominence. Its compactness, ease of installation and comparative good economy, together with fine running qualities, peculiarly adapts it for the rough service required around coal mines. The accompanying illustration shows two of these small generators.

Fig. 1 is a 15-kw. unit at the Bearcreek Coal Co.'s plant at Bearcreek, Mont. Fig. 2 shows a 35-kw. machine at the Midland Mine, of the Rocky Mountain Fuel Co., at Sunshine, Colo.

In both of these installations the prime movers are Kerr turbines. While the steam consumption of these small machines is not quite as low as that of four-valve or compound engines, their compactness, small installation cost and the fact that a large amount of skilled attendance upon them is unnecessary, is bringing them rapidly into favor.

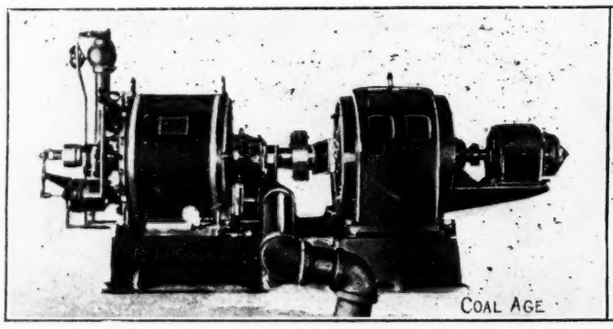


Fig. 1. 15-Kw. Turbo-Generator at Bearcreek, Mont.

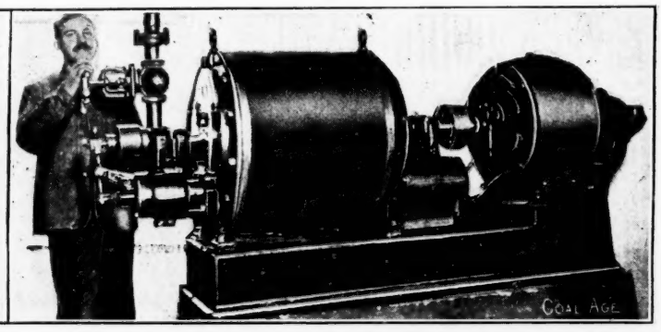


Fig. 2. 35-Kw. Machine at Sunshine, Colo.

Colliery Notes

Great consideration should be given to the valves of an air compressor. Inlet valves should be as large as possible; in practical work they are not more than 15 per cent. of the sectional area of the cylinder. On the other hand the outlet valves should be as small as possible and should open as soon as the required pressure has been reached.

In mining work, multiple-stage air compression is not of much practical advantage for pressures under 60 lb., but it is increasingly advantageous for higher pressures; in the use of the latter there is a proportionately increased loss from leakage. An additional advantage in stage-compression is gained by intermediate cooling between the cylinders.

If the initial pressure remains constant while a volume of compressed air is being discharged through a pipe, the loss of pressure is proportional to the length of the pipe. As the air increases, the velocity becomes greater and the friction increases as the square of the velocity. Hence, where compressed air is to be used, large sized pipe is often a matter of economy.

Unused slack means a waste of from 5 to 50 per cent. of the total output of different mines. Coking slack is easily disposed of. Noncoking, readily caking slack, is good for use under boilers, as it fuses easily and is capable of being burned with but little loss. Medium coking slacks demand specially constructed grates; even then the percentage of waste is higher than when coal is used.

EDITORIALS

The Schaefer Method

In the contest for supremacy between the Sylvester and Schaefer methods of resuscitation, the latter system appears to be winning. The former was adopted by the Red Cross society and was by them engrafted in the rescue service of the Bureau of Mines without the opportunity for extended consideration. At the time there was an immediate demand for action, and deliberation on methods of first aid had to be left to the future.

The Committee on First Aid Methods at the Mine Rescue and First Aid Conference declared that "the Sylvester method of artificial respiration is preferable, provided that no injury to the person to be resuscitated prohibits its use." Evidently the Schaefer method obtained at least a foothold by this declaration of faith. For if the Sylvester system is not always applicable, some alternative treatment will have to be taught, though none except the pulmotor method can be applied alike to all the cases which are amenable to treatment.

The advantages of the Schaefer treatment over the Sylvester are: (1) It is easier to learn; (2) it can be performed by a boy or an adult for an unlimited time without exhaustion; (3) it supplies more "tidal air"; (4) it places the victim so that his tongue naturally falls from the back of his mouth; (5) it enables secretions, excessive or otherwise, and leaking serum to pass away by gravity so that the patient does not need to be rolled in order to prevent him from drowning in his own secretions; (6) it is available even when the muscles of the arms are contracted tetanically; (7) it does not put the man in an unnatural position so as to cause an increase in hemorrhages in the brain and cord.

Against these arguments the advocates of Sylvester's method urge that the face of the victim is apt to be plunged in the mud and some declare, we think wrongly, that the ribs of the patient may be broken by the pressure.

The reasons we have given for preferring the Schaefer method are those urged by Dr. Charles A. Lauffer in his "Electrical Injuries," but we think he has omitted one argument which his lack of knowledge of mining methods has caused him to overlook.

The Sylvester method is a purely external system of operation. The arms are raised. The moving of these pulls on the muscles and raises the ribs which thus produce an enlargement of the chest. Then the arms are lowered and doubled against the ten upper ribs. The chest is thus reduced in size and the "tidal air" is driven out.

In these actions many muscles are brought into play, some indeed which do not have any effect on the dilation or compression of the chest cavity, muscles, for instance, which run from the shoulder and arm to the back of the victim, the extension of which while entirely unbeneficial in the restoration of breathing, may be accompanied by extreme harm to the man being resuscitated.

It is no less essential to remember that whether any thoracic muscle actually tends to produce the heaving of the chest is not important as far as the resulting injury is concerned; an unfunctioning tension or compression is as detrimental as one which performs the objects sought.

It is true that those pectoral muscles (*pectoralis minor*) which are much strained in the Sylvester method lie for the most part below muscles not so strained, but everything outside the chest including the inclosing ribs may be regarded as external and much subject to injury. Consequently, as a general principle, not, of course, without numerous exceptions, we may suspect that a man injured by a blow is not a fit subject for the Sylvester treatment, because the latter utilizes muscles and ribs which may be injured. Furthermore, that method is usually undesirable in case of burns, because it strains and compresses muscles which are likely to have been injured by fire, though the muscles affected do not function most actively in the recovery of the respiratory action.

On the other hand, the Schaefer method utilizes the floating ribs. These are forced inward so as to press the internal organs, the stomach, spleen and liver up against the diaphragm. Thus the chest is crowded into a small space without pressure on any of its parts, other than on the one wall which is not external. Hence, Schaefer's method is an internal operation in comparison with that of Sylvester.

F. L. Hoffman, in our issue of Aug. 9, shows that in the anthracite mines, 5.5 per cent. of the serious accidents affect the "trunk," while 26.7 per cent. affect the shoulder, arms, wrist, hand, collarbone and ribs. A less marked difference is shown in the accidents of the bituminous field of Pennsylvania. There, 10.5 accidents to the trunk occur to 21.4 in the regions of the body moved during the Sylvester treatment.

It must be conceded that the figures given are not used with entire fairness because blows on the arms and wrist are not likely to inhibit the action of the diaphragm and so the lesser number of injuries on the abdominal regions may nevertheless merit the greater consideration.

But, conversely; as it is in burning accidents that asphyxiation occurs, demanding the restoration of breathing, the location of burns is worthy of consideration. It is more important to consider the parts which are most affected by these specific accidents than to enumerate the frequency with which the various parts are affected by injuries in general.

As a miner works with a low shirt and short sleeves and sometimes without any sleeves at all and as his clothes are gathered tightly around his waist by his belt, it is probable that he is burned in even greater proportion in what for brevity of speech we will designate the Sylvester regions.

When a man stands in inflammable gas, the upper part of his body is in a richer mixture than his waist and consequently more severe burns are likely to be found there; moreover, the gas will not be ignited by a hand lamp where the gas accumulation is small unless one of

the man's hands is raised to convey the light to the gas. Hence burns are generally in the head, chest and arms.

These considerations make us view the Schaefer method as the one more suited for use in instruction. Where it cannot be used, we fear that all hope is in vain. The man is probably dead, not merely stunned into inaction; he is burned to a crisp or injured internally so that the undertaker has more interest in the matter than the first-aid man.

One further consideration puts the statistical argument more definitely in favor of the Schaefer method: It must be granted that, as Mr. Hoffman has deduced his figures from the reports of the inspectors, the word "trunk" has an uncertain statistical meaning and though it is likely in some cases to mean the abdominal regions, it probably even more often refers to the chest and back. In fact, we are informed that injuries to these parts are included in the enumeration of trunk accidents. Consequently, the ratio between the injuries declared to affect the Sylvester regions and those recorded as involving the "trunk" must be smaller than that existing between injuries of the Sylvester regions and accidents involving the abdominal regions only.

If we figure on the interesting data given by Mr. Hoffman, inadequate as they are for our special purpose, we shall probably err to the disadvantage of the Schaefer method and give those who differ from us the best of the argument. But we quote the figures for what they are worth. The percentage of availability of the Schaefer system in the anthracite region would be 82.9 per cent. and in the bituminous coal fields of Pennsylvania 67.1 per cent. The Sylvester method would be of service, therefore, in only 17.9 and 32.9 per cent. of the cases. Why teach a system so rarely available in mining practice and why declare that its use is to be preferred?

From Panama to Alaska

That enterprising senator, for the state of Washington, Miles Poindexter, has a brilliant idea which he intends to embody in a bill for introduction into the United States Senate. This new motion of the senator will appeal to the humor of mining men, though we can well conceive that the ordinary citizen, unacquainted with mining and dazzled by modern engineering achievement may believe the scheme feasible. Poindexter desires to utilize the machinery which excavated the Panama canal to mine coal in the Alaska fields.

These coal areas have caused vehement discussion for a long time, and a just solution of this troublous problem would be welcome, except to those who make capital by keeping the debate alive. Of late the coal beds have not figured so prominently on the political horizon as they did a few years ago, and meanwhile accurate knowledge concerning them has been more generally disseminated. But they may now reappear as star performers in the political arena with the senator from Washington as stage manager.

It is apparent to all those interested in mining that the machinery which has been used in Panama is not adapted to underground work. A large steam shovel could not be taken into a mine to work beds such as are ordinarily encountered. Even in some of the seams of Alaskan coal, which are popularly reputed to be one hundred feet thick without a slate parting, it would be difficult to work any large machine on account of the width of the opening necessary and the weakness of the roof.

Much of the coal could be mined with a steam shovel were it only clean, level and safe for such operation, but the last two desiderata are more conspicuously absent in the coal of Alaska, than in perhaps any other known field. The only use for the shovels and excavators would be in the building of the railroad or in open cutting for coal. Just how large a tonnage could be economically obtained by a removal of the surface is doubtful and the demand for coal is not such that the whole Panama paraphernalia could find appropriate use.

Among the many features in this bill is one outlining a profit-sharing plan between the government and its mine employees. It is by no means certain that the federal authorities can with advantage enter the competitive field and sell coal at a profit and the proposal that the government should only mine half the coal, leaving the rest for individual exploitation is an equally questionable policy. Any mining man knows, to state the question in the form of an Irish bull, that one cannot tell what is in the ground until it has been taken out.

A waiter once demanded "which side?" when a finical customer called for an egg fried on one side only. It might be permissible to inquire of Poindexter "which half that hapless operator is to control who takes up the burden of competing with the boundless resources of the government?"

Coal Shipping on the Great Lakes

We call particular attention to the series of articles dealing with coal transportation on the Great Lakes now appearing in COAL AGE. It is our purpose to cover the subject in great detail, so that when completed, the full discussion will form the most exhaustive treatise ever published on this topic.

The importance of this subject will be better appreciated when it is remembered that during 1912, there were over 23 million tons of bituminous coal shipped by way of the Lakes, in addition to some 4 million tons of anthracite. One of the most singular features of the Lake trade, however, is the remarkable rapidity at which it is increasing. A decade ago the movement of soft coal *via* the Lakes was only one-third the present tonnage.

Thus it will be seen that the water shipments have trebled during the past ten years, while the country's production during the same period has only doubled. The inference is plain. Water transportation of bulk freight, where available, has proved an economically sound principle, and will be an important factor in determining the geographical distribution of the coal markets of the future.

One Way to Avoid Trouble

The crying need of mine management is a greater knowledge of common law. In this issue we have started a "Legal Department" to aid coal officials in mapping out a proper course of action in their everyday work. Study the articles in this new department and thus acquire knowledge that will enable you to avoid annoying collisions with legal obstacles.

LEGAL DEPARTMENT

Are Contracts to Abandon Coal Trade Valid?

By A. L. H. Street*

SYNOPSIS—The decisions, while somewhat variant, agree in endeavoring to insure the purchaser in the possession of the good will purchased. In all decisions it is ruled that the territory over which the restriction is applied must be the same as that over which the trade thus restricted has already been established and in many cases the judges have ruled that the time should also be limited.

May one previously engaged in the coal trade, as producer or dealer, legally bind himself not to re-engage in business in competition with a person, firm or corporation to whom he has sold his business and good-will? The business advantages accruing to the purchaser from such an agreement are obvious, but the exact limits set by the law on contracts intended to secure those advantages are, perhaps, not generally understood; and the question becomes particularly interesting when it is considered that such an agreement may become wholly void through an attempt to secure greater rights to the purchaser than the law gives him.

Is It Invalid to Sell Good Will?

Formerly it was held uniformly by the courts that any contract whereby one purported to preclude himself from engaging in any legitimate pursuit anywhere or at any time, no matter how limited, was void. The reasoning upon which this holding was based was that the public is entitled to the fullest possible competition between business men in their chosen vocations; otherwise monopolies would be created. But this rule was gradually modified as the courts came to recognize the injustice of permitting one who has sold a valuable good will to deprive the purchaser thereof by reëntering the trade, especially before the latter has had an opportunity to fortify himself against such competition by acquaintance and course of dealing with his new trade.

Accordingly, it has now become a general rule of law that a contract by the seller of a business not to engage in competition with his successor will be enforced by the courts, by awarding damages for breach of the agreement and by enjoining further violation of the contract, if the agreement be limited to the territory in which the seller established his trade; but in some states it is held by the courts that there must, also, be a reasonable limitation as to the time during which the seller's competition is to be barred. The test of validity usually applied is whether the contract is reasonably necessary to secure the purchaser in the enjoyment of the good will of the business bought.

In a case which arose in the coal trade (George & Chapman vs. East Tennessee Coal Co., 83 Tenn. Supreme Court Reports 455), the rule is thus summarized: "A contract not to carry on one's business anywhere is void, but a contract not to carry it on in a particular place, or within certain limits is valid." And, according to a decision of the Minnesota Supreme Court, sale of the good will of an established business, in connection with the sale of that business, is not, if reasonable in other respects invalid because unlimited as to time. (Southworth vs. Davidson, 118 Northwestern Reporter 363.)

On the other hand, the Appellate Division of the New York Supreme Court holds that a contract not to engage in a business, not limited as to time and place, is void as being against public policy (Von Bremen vs. MacMonnies, 122 New York Supplement 1087); and that a contract purporting to obligate the seller of a business not to engage in a similar business will not be enforced, unless the restrictions are limited as to time and territory, and the agreement is necessary in order to give the purchaser the benefit of his bargain. (Fries vs. Parr, 139 New York Supplement 220.) The Michigan Supreme Court has applied a similar test. (Weickgenant vs. Eccles, 140 Northwestern Reporter 513.)

Reasoning along the same lines, the Kentucky Court of Appeals holds that a contract, made upon selling the good will of a business, not to again pursue it in the country, is unenforceable, but that a contract is valid, if it restrains the conduct of the business to such an extent of territory only as is necessary to protect the purchaser. (Linneman & Moore vs. Allison & Yates, 134 Southwestern Reporter 134.) In Louisiana, the rule is thus broadly stated: "One may bind himself never to pursue a particular calling within reasonable geographical limits, or not to pursue such calling at all within a reasonable time." (Louisiana Supreme Court, Moorman & Givens vs. Parkerson, 54 Southern Reporter 47.) In Alabama, such agreements are sustained if limited to the city in which the business sold is conducted, though not limited in duration beyond the time that the purchaser shall remain in the trade. (Alabama Supreme Court, Smith vs. Webb, 58 Southern Reporter 913.)

Contract of Restriction Not Invalid though Entered Into with Several Competitors

The principles above stated, as applied especially to the coal trade, are well illustrated by the following summaries of decisions handed down by the highest courts of the country: A person who owned coal lands, mines and boats sold them to a company, agreeing not to engage within ten years in the business of mining or shipping coal in the territory traversed by the Monongahela, Ohio and Mississippi rivers and their tributaries. This contract was upheld by the Pennsylvania Supreme Court in the case of Monongahela River Consolidated Coal & Coke Co. vs. Jutte, 59 Atlantic Reporter 1088, as being a reasonable contract and not violative of public policy, though the company had similar contracts with a large number of other coal operators who had previously done business in the Monongahela Valley in Pennsylvania.

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Another contract by a retail dealer, in selling his business at Auburn, Neb., not to reëngage in business directly or indirectly, in that town or in the vicinity thereof, except that if his successor should discontinue a lease on the seller's yard at the expiration of five years, the seller might reënter the trade, was upheld by the Nebraska Supreme Court in the case of Engles vs. Morgenstern, 122 Northwestern Reporter 688, as against objection that the contract violated the statutes of that state directed against combinations in restraint of trade. In a Michigan case, the lessee of a dock upon which he conducted a coal business sold nearby land, on which was located another dock, under agreement that the purchaser should conduct no business that would conflict with the seller's trade. The United States Circuit Court of Appeals sustained the validity of the agreement, as limited to the property sold. (Hitchcock vs. Anthony, 83 Federal Reporter 779.)

The Illinois Supreme Court holds that a contract is not in unlawful restraint of trade by which one agrees to buy the business of a particular coal merchant and then to buy coal at wholesale from the other party to the contract, in consideration of which the latter binds himself not to sell coal at wholesale to any other dealer at the place; it not appearing that the output of any other wholesale dealer or purchaser of coal was in any way affected, or that there is anything to establish the price of coal at that place. (Superior Coal Co. vs. E. R. Darlington Lumber Co., 86 Northeastern Reporter 180.)

Agreements on Dissolution of Partnership

As a general rule, the principles above stated are applicable to the sale by a partner of his interest, under agreement with the continuing partner that he will not reëngage in business in competition with the latter. It is, also, held that a seller of a business cannot avoid the effect of a contract of this kind here discussed by transacting a competing business under the name of a third person who was not a party to the contract.

It will be noted that the observations here made are limited to cases in which promises to refrain from competition are made in connection with the sale of a business or property. The writer leaves closely related questions concerning joint-selling arrangements between producers or dealers as the subject of an independent article.

Time for Delivery of Coal Sold

Contracts to sell 600 tons of coal were recently construed by the St. Louis Court of Appeals, in the case of Big Muddy Coal & Iron Co. vs. St. Louis-Carterville Coal Co., 158 Southwestern Reporter 420, with reference to the seller's duties and rights concerning the time of delivery. The first contract bound the seller to ship 300 tons of screened coal for delivery at Illinois points on board cars, "shipments to be made during the following months: July, 20 cars; August, 40 cars; September, 60 cars; October, 80 cars; November, 40 cars; December, 40 cars; and January, 20 cars." The other contract called for the same total quantity, distributed throughout specified months in quantities varying from 20 to 80 carloads per month.

Neither agreement expressly required the buyer to give orders for shipments, nor contained shipping directions beyond specifying the destinations and the railway company whose cars were to be used, but the seller furnished a blank order book to the buyer. It also appeared that the seller was advised that the coal was bought for resale to a third company under contracts, which made the same provisions as to the times for delivery as the contracts above referred to.

Defendant Tried to Enforce Delivery When Prices Were High and Refused Coal When Selling at a Low Price

Defendant buyer ordered out less coal than was provided for by his contracts, and the quantities so ordered were shipped. When plaintiff sued defendant for the price of the coal delivered, it appeared that 284 carloads called for by the contracts had not been delivered, and defendant counter-claimed for damages claimed to have resulted to it from failure to ship that quantity.

But, on the facts above stated, the Court of Appeals decided that the contracts between plaintiff and defendant should not be interpreted as binding plaintiff to ship the coal, except as ordered out by defendant buyer, and that was admitted to have been done. In other words, the seller was not bound, under the wording of the contracts and the course of dealings between the parties, to tender deliveries in the quantities and during the months mentioned in the agreements.

It was further held that in such contracts the time of delivery is of the essence of the contract, and that the provisions for delivery of the specified quantities each month would be construed to require delivery of that amount upon orders received during the month, and not to permit the buyer to order a less quantity in the earlier months when the price was low, and then require deliveries of the remainder of such quantities just before the termination of the contracts when the price was high, especially where the buyer had written a letter reducing quantities previously ordered, on the ground that former orders had exceeded the amount provided for by the contract for that month.

Legal Decisions

Effect of Bankruptcy of Company on Lease—Where a coal-mining lease provided for payment of royalties to be suspended in the event of strikes, car shortage, etc., and the lessee company became bankrupt and the lessor accepted a surrender of the property, he is not entitled to enforce a claim against the estate of the company for royalties claimed to have accrued after the bankruptcy of the company. (United States District Court, Northern District of Alabama; in re Gallacher Coal Co.; 205 Federal Reporter 183.)

Liability for Injury to Minor Employee—A mining company operating in Pennsylvania is not relieved from liability for injury to a minor employee, due to failure to warn him against a danger, because it employed a certified foreman as required by the laws of that state. (Pennsylvania Supreme Court, Bogdanovicz vs. Susquehanna Coal Co., 87 Atlantic Reporter 295.)

Terms of Payment for Goods Sold—If nothing is said when a contract of sale is made as to when the price is to be paid, it will be presumed that the parties intended that payment should be made by the buyer on delivery, and on his failure to pay then the seller will be entitled to reclaim the property. (Arkansas Supreme Court, Hamilton vs. Rankin, 158 Southwestern Reporter 496.)

Duties of Mine Owners—Under the laws of Pennsylvania, it is the duty of a mine owner to provide proper passageways in tunnels, for the safety of miners, and liability for breach of this duty cannot be avoided by delegating its performance to a mine foreman or other employee. (Pennsylvania Supreme Court, Simmons vs. Lehigh Valley Coal Co., 87 Atlantic Reported 568.)

DISCUSSION BY READERS

Mixed Lights in Mining

Letter No. 13—I have been greatly interested in the discussion on the use of mixed lights in mining and, particularly, in Letter No. 9, by R. Z. Virgin, COAL AGE, Aug. 16, p. 244. An experience of 26 years has convinced me that no miner can be trusted with an open light in a mine generating explosive gas; and I fully agree with the statement that no naked light should be allowed in any mines where gas has been detected or may be reasonably expected.

There are two other statements made by Mr. Virgin, however, that I must say most emphatically are contrary to my own experience. He states: 1. The safety lamp has no ill-effect on the eyesight of the miner compelled to use it in his work. 2. A miner using a safety lamp can produce as much coal, in a day, as one using an open light.

In reference to the first point mentioned, I can speak from sad experience; and, let me say, my case is by no means an isolated one. In the district where I was born and raised, Hamilton, Scotland, the safety lamp has been used almost exclusively, for many years, and this practice still continues. My use of the safety lamp began at the age of 11 years and continued for a practically unbroken period of 16 years.

The first serious results developed during the fourteenth year of my use of this lamp. I was attacked, in the mine, by a severe vertigo and twitching of the eyeballs. I sought the Glasgow Eye Infirmary and was told by the consulting physician that mine was a well developed case of miners' nystagmus, which was recognized by medical men in that district, as being caused by the constant use of the safety lamp. I was informed that my only salvation was to give up the use of the lamp. The trouble continued to increase from that time. Later, about nine years ago, I came to this country and have worked with an open light ever since. For the past three years I have used the carbide lamp and can truthfully say that my eyesight is much improved, being practically 100 per cent. better than when using the safety lamp, in the old country.

In reference to Mr. Virgin's second statement, that the use of a safety lamp does not lessen the miner's producing power, I would ask if it is sensible to suppose that a man burdened with the care of a safety lamp can compete with another man using an open light hung on his cap. In my opinion, no man who has used both of these lamps would agree with Mr. Virgin in his last statement. That the lamp is a burden to the user no one will deny, as it must be handled carefully and watched continually.

In conclusion, I wish to say that, where conditions demand, safety lamps should be used, unquestionably; but, at the same time, the miner must be made acquainted with the ill effects produced by the continued use of the safety lamp.

JOHN MAC NICOL.

Seanor, Penn.

Mine Development

Referring to the mine map shown on p. 211, COAL AGE, Aug. 9, which is a good one, permit me to make one or two suggestions how I think it can be improved.

The triple-entry system, shown on the main entries and the first two pairs of cross-entries, is an important feature; and I would suggest that the next two pairs of cross-entries, inby from these, should also be driven on the triple-entry system, while all other cross-entries can be driven on the double-entry system.

Again, it would greatly increase the output, for the same amount of entry driven, if the cross-entries were driven further apart and rooms turned to the right and left of each pair of entries. This plan would give double the number of rooms and would double the output of coal, for the same cost of entry driving and operation. The rooms should be driven right-hand on one entry and left-hand on the other entry. The tracks in each room should be carried along the straight rib. As soon as the first two or three rooms are driven up, the work of drawing back the pillars should be commenced, so that the rooms can be finished while the tracks and timber are good, which will decrease the cost of moving slate and keeping up track in the rooms. All rooms and entries should be driven on centers, so that the pillars will be of uniform thickness. If the roof is good, the cross-entries can be driven 600 ft. apart, making the rooms 100 yd. deep; but this will depend wholly on the condition of the roof and floor.

It is a good plan to drive the crosscuts as shown at the mouth of each pair of cross-entries; but I would suggest, further, that another crosscut should be driven at, say No. 10 room. This would provide an empty and a loaded track and avoid any loss of time from mules or motors waiting on each other.

In my opinion, all mines should be opened on a plan that will provide for the handling of gas, if this should be found later. Good ventilation should be provided by placing doors, stoppings, regulators and overcasts as quickly as needed. Where gas may be expected, brattices and curtains should be arranged to keep the working face clear.

While the present plan will, undoubtedly, provide for an output of 1000 to 1200 tons per day, this output could be increased to 2400 tons per day, for practically the same expense of entry driving and operation, by turning rooms off both entries, as suggested. While there may be no water to handle in this mine, I believe it is always best to provide a sump for draining; and this should be located between the first two pairs of entries, unless the mine drains naturally. I would also suggest putting a fan at both the right and left entries; that is to say, installing two fans instead of one. This would provide reliable ventilation and guard against a possible breakdown, which is liable to happen at any time.

SAMSON SMITH.

Mineral, Va.

The Training of Miners

Much is written lately on the education and training of mining men, particularly the miner at the working face. Many suggestions of more or less merit have been made in reference to how this work can be best accomplished; and, in this connection, the recent article of State Mine Inspector Nesbitt, COAL AGE, Aug. 9, p. 206, has attracted my attention.

Mr. Nesbitt advocates, in his article, placing a safety inspector and instructor in each coal mine, for the purpose of instructing the miners in reference to safety and economy. In my opinion, this suggestion of Mr. Nesbitt does not get at the root of the matter. There is an old and true saying, "Train up a child in the way he should go and when he is old he will not depart from it." This applies as well to mining. The best miners, and, indeed, the only practical miners are those who have been taken into the mines by their fathers and trained in the work.

There is, today, too much "wildcat work" in coal mining. Grown men who have never handled a pick or seen the inside of a mine are employed today as miners. They go into the mine because they cannot get work at any other trade. They are filled with horror and fear and, because of their lack of knowledge of mining conditions, they are wholly incapable of taking care of themselves while at work. Many of them, after working a day in the mine, fail to return to their work, and the next day it is found that they have left their place in bad shape.

There are many things a miner should know before he is permitted to work in a mine. He should understand the principle of the safety lamp and how to use the lamp at his work. He must be taught the practical work of putting up a brattice, hanging curtains, laying tracks, handling cars; and, particularly, how to keep himself safe while at work, by properly timbering his place. He must know how to take down a loose piece of slate and set posts required to make the place safe. He should learn these things when he is young. The way to reduce accidents is to employ more practical miners—men who understand good mining and have mined coal all their life.

The world takes notice of great mine accidents where many lives are lost at a time; but the constantly recurring daily accidents, when a single man, or two or three are killed, excites little interest and the death list grows. Who or what is responsible? It is the insatiate greed for coal and the common disregard for the safety of the worker, for which, in many cases, the inexperience of the fireboss or mine foreman is responsible. Train the miner when young.

SAMSON SMITH.

Mineral, Va.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

MINE VENTILATION

The ventilation of a mine, as the term implies, involves the supply and maintenance of a sufficient current of air throughout the mine to render the same healthful and safe.

Requirements of Ventilation—The quantity of air in circulation must be sufficient to comply with the state mining law, and to dilute, render harmless and sweep away the gases that would otherwise accumulate in the mine. The air current must be conducted so as to sweep the entire working face and all void places with a moderate velocity sufficient to remove the gas without danger to the lamps or inconvenience to the workmen.

The Circulating System—In order to circulate a current of air through a mine, it is necessary to provide two separate openings, one for the air to enter, called the "intake opening," and the other for it to leave the mine, called the "return" or "discharge opening." Two distinct air passages or airways are also required, leading from these openings into the mine, in order to conduct the air current to and from the working face. These are called, respectively, the "intake" and "return" airways. These openings and airways form a part of the circulating system in the mine, similar to the arteries and veins of the human body.

Kinds of Ventilation—There are three different kinds of ventilation, in mining practice, known as "natural ventilation," "furnace ventilation" and "fan ventilation," according to the agency employed for its production.

Natural Ventilation—Ventilation is natural when it is produced by any natural agency, such as surface winds, falling water or the natural heat of the mine. The accompanying diagram illustrates the manner in which the natural heat of the mine produces a warm upcast air column, in either a drift mine or a shaft mine.

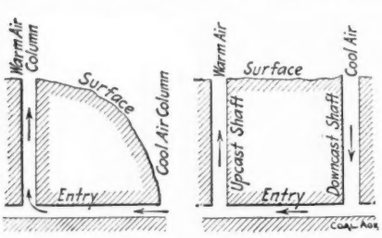


DIAGRAM OF A DRIFT MINE

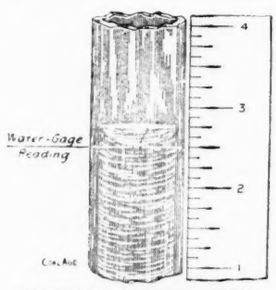
DIAGRAM OF A SHAFT MINE

In the drift mine shown on the left, the warmer air column in the shaft only partly balances the cooler outside air. Above the level of the top of the shaft the two air columns are of equal temperature and equal weight, and, therefore, need not be considered since they balance each other. The same is true in the shaft mine shown on the right, whenever the two shafts have the same elevation at the surface.

The Coal Age Pocket Book

Reading the Water Gage—In the common use of the water gage, in mine practice, the scale is not read closer than ⅛ in. In all engineering practice, however, and whenever accuracy is desired the decimal scale, previously shown, is used and the reading taken to hundredths of an inch.

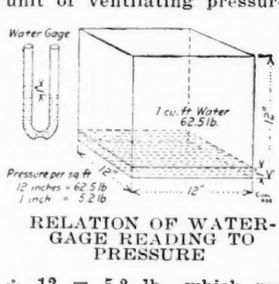
There are several sources of possible error in reading the mine gage. If the gage is not truly vertical the reading will not be correct. Error often occurs from the cupping of the surface of the water in the tube. As shown in the accompanying figure, the reading should be taken at the bottom of the concave or bowl. This will give greater uniformity in the results obtained.



SHOWING WHERE THE WATER GAGE IS READ

In fan ventilation, especially when the reading is taken in the fan drift, there is a constant oscillation of the water level, which makes it difficult to decide on the true reading. The oscillation is much reduced when the tube of the gage is contracted at the bend. The best gages are provided with a stop-cock in the bend by which the connection between the two arms can be closed. The gage can then be carried to a more convenient place to be read.

Unit of Ventilating Pressure—In mine ventilation, the unit of ventilating pressure or the unit pressure producing the circulation is estimated in pounds per square foot. This is calculated from the reading of the water gage by multiplying that reading, in inches, by 5.2.



RELATION OF WATER-GAGE READING TO PRESSURE

The accompanying figure shows clearly how the constant 5.2 is derived. The weight of 1 cu.ft. of water is, practically, 62.5 lb. This cubic foot represents a cube that measures 12 in. on each edge; the base of the cube being 1 sq.ft. Since the weight of 12 in. of water, resting on this square foot, is 62.5 lb., the weight of 1 in. of water covering the same area is 62.5 ÷ 12 = 5.2 lb., which represents the pressure, in pounds per square foot, due to 1 in. of water column. The principle involved is that the pressure exerted on a given area of surface depends only on the height of water column the pressure supports.

INQUIRIES OF GENERAL INTEREST

Another Hoisting Problem

At one of our mines, the opening is a shaft 220 ft. deep. We are using a 1¼-in. cable, which winds on a drum 7 ft. in diameter. We contemplate using a 1⅛-in. cable on one side of the drum, while still hoisting with the 1¼-in. cable on the other side of the same drum. What effect will this have on the hoist?

J. B. MORRIS,
The Cambridge Collieries Co.

Cambridge, Ohio.

When a cable is wound on a drum, what is called the "diameter of winding," or the diameter measured from center to center of the rope wound on the drum, is greater than the diameter of the drum, by the diameter of the rope. The diameter of the drum, in this case, is $7 \times 12 = 84$ in., which makes the diameter of winding 85¼ in., for the 1¼-in. rope; and 85⅛ in. for the 1⅛-in. rope. Since the circumference of a circle is proportional to its diameter, the distance of hoist, for the same number of revolutions of the drum, is as 85¼ : 85⅛. The distance hoisted by the 1⅛-in. cable while the 1¼-in. cable is hoisting 220 ft. or the depth of the shaft, is determined by the proportion:

$$85.25 : 85.125 :: 220 : x = 219.67 \text{ ft.}$$

This shows that while the 1¼-in. cable is making a single hoist of 220 ft., the 1⅛-in. cable will only hoist 219 ft. 8 in., which lacks 4 in. of making the upper landing. This difference is so slight, however, that the stretch of the hoisting rope and some slack will take care of the same. Caution will be needed in starting the next hoist from the bottom, owing to the slack rope. The difficulty can be overcome to some extent by lining the drum with canvas on the side on which the lighter rope winds, or, by shimming the lagging on that side to increase the diameter of the drum.

❖

Method of Working

We are working a 7-ft. seam of coal overlaid with a sand slate from 4 to 7 ft. thick. Above the sand slate is a thin seam of good coal, 21 in. in thickness. The first mining has been done on the room-and-pillar system; the waste has been stored in the chambers. The workings have been extended, in this manner, to the extreme end of the property. The question is now: What is the best method to employ for the extraction of the pillars in the 7-ft. seam and the thin coal overlying the roof slate? What method will give the greatest safety and economy, in drawing back this work? Perhaps some readers have had a similar proposition and can give their experience.

J. H. S.

Bernice, Penn.

Assuming that there is a large area worked out and standing on pillars, in the 7-ft. seam, the question presented is how to draw back the pillars in the lower seam and secure the 21 in. of coal overlying the roof slate, which varies from 4 to 7 ft. in thickness. The size of opening, width of pillars and depth of cover are not given; and the character of the strata overlying the thin seam is not mentioned. These data together with the character of the coal in both seams will determine whether or not it is practicable to attempt to mine this thin seam of coal.

If the coal in the upper seam is an excellent quality, and other conditions are favorable, it may be practicable to undertake its extraction. If, however, the coal is of poor quality or the conditions in the overlying strata are unfavorable the expense attending the mining of this coal will be too great to make it an economical proposition. There may be water overlying the upper seam that would entail a large expense in pumping; or the strata immediately above this seam may be soft and friable, making the expense of working prohibitory. All of these conditions must be carefully considered, before the questions asked by the correspondent can be intelligently answered.

With what information is at hand, the only safe method that suggests itself is to flush the workings in the lower seam, except the entries. Then, beginning at the boundary line, start an upraise to the overlying seam and determine whether or not it will be practicable or possible to mine the overlying seam, independently. If it is practicable to mine this thin seam, the coal can be dropped through openings in the floor to the roadways in the seam below and taken out on these roads.

The feasibility of this method can only be determined by trial. It is probable that the coal in the upper seam will not pay the handling of the intervening 4 to 7 ft. of sand slate; and, for this reason, the upper seam, if mined at all, must be mined independently, by some method similar to that described. The pillars in the lower seam should not be drawn until the overlying seam has been worked back. The work should be conducted on the retreating plan.

❖

Weight of Water in Air Current

Kindly show what weight of water is contained in 100,000 cu.ft. of air at a temperature of 60 deg., assuming the air to be completely saturated.

PUMPMAN.

Punxsutawney, Penn.

In order to calculate the weight of aqueous vapor contained in this volume of air, it is necessary, first, to know the tension of the vapor at the given temperature, which is found from psychrometric tables to be, for 60 deg., 0.2545 lb. per sq.in. The required weight of water carried in the air current is then

$$w = 100{,}000 \left(\frac{0.6235 \times 0.2545}{0.37\ (460 + 60)} \right) = 82.47 \text{ lb.}$$

This amount of water is equivalent to two and one-half tons per hour.

EXAMINATION QUESTIONS

Miscellaneous Questions

(*Answered by Request*)

Ques.—When is a safety lamp safe, and why?

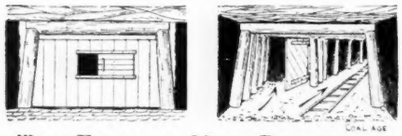
Ans.—A safety lamp of any approved type is only safe when handled by a competent person, in a proper manner. The reason is that the principles on which safety depends must be understood and closely observed by the one using the lamp. The lamp must be held in an upright position, must be kept clean, must not be exposed to a strong blast or current of air, and must be removed cautiously and promptly from a body of gas as quickly as observed.

Ques.—The hand of a Biram anemometer turns 3.75 times a minute. At the point where the reading is taken, the airway measures 5.5 by 9 ft., in cross-section. What is the velocity of the air current, allowing 3 per cent., for the resistance of the instrument?

Ans.—The sectional area of the airway is $5.5 \times 9 = 49.5$ sq.ft. The anemometer is graduated to indicate a velocity of 100 ft. per min., for each revolution of the large hand. In this case, the velocity of the air current is $3.75 \times 100 = 375$ ft. per min. Allowing 3 per cent. for the resistance of the instrument, the actual velocity of the air current is $375 \div 0.97 = 386.6$ ft. per min. The volume of air in circulation is then $386.6 \times 49.5 = 19{,}136+$ cu.ft. per minute.

Ques.—What is a regulator and where can it be used to advantage?

Ans.—A regulator, in mine ventilation, is a device used for dividing the air proportionately between two air splits. The common form of regulator is that known as the "box regulator." This is shown on the left of the accompanying figure. It consists of a brattice or partition of wood or concrete built in an entry, which is generally the return airway of a pair of entries or section of the mine. In the center of the brattice is provided an opening, the area of which can be increased or decreased by moving the sliding shutter or door shown in the figure. By this means, the quantity of air in that split and passing through the regulator can be increased or decreased as desired. The regulator is commonly placed at the return end of that split which naturally takes more air than its desired proportion. The action of the regulator is to decrease the proportion of air in that airway or split, which increases the proportion for the remaining splits.



TWO FORMS OF MINE REGULATORS FOR DIVIDING THE AIR

Another form of regulator is that shown on the right of the figure, and which consists of a door swung so as to divide proportionately the intake current. This regulator is usually placed at the intake end of the two airways and can be set so as to divide the air in any desired proportion between the two splits.

Ques.—Where would you expect to find nitrogen and carbon dioxide, in a mine? Give their symbols, weights and specific gravities; and state how the presence of these gases is detected in the mine.

Ans.—Nitrogen and carbon dioxide are the two principal products of combustion. For this reason, they are to be found in those portions of the mine where the ventilation is slack and the various forms of combustion are in progress. The burning of lamps, breathing of men and animals, burning of powder, slow combustion of coal and decay of wood, continually taking place in the mine, consume the oxygen of the air and leave nitrogen and carbon dioxide as a result.

The symbols, specific gravities and molecular weights of these gases are as follows. Nitrogen; symbol, N_2; sp.gr., 0.97; mol.wt., 28. Carbon dioxide; symbol, CO_2, sp.gr., 1.529; mol.wt., 44. The presence of these gases is detected by the dimness of the lamps and the difficulty of keeping a light. Carbon dioxide is most apt to accumulate in the low places or swamps and dip workings of the mine.

Ques.—If there is 5000 cu.ft. of air passing per minute through the last cut-through, in an entry, and this current contains 5 per cent. of marsh gas, how much air should be added to the current to reduce this amount of gas to 1 per cent.?

Ans.—The volume of gas in this current is $5000 \times 0.05 = 250$ cu.ft. per min. If this amount of gas is to be 1 per cent., the total volume of gas and air, in that case, would be $250 \div 0.01 = 25{,}000$ cu.ft. per min. Now, assuming that the original current was mixed air and gas, the volume of air required to be added to reduce the gas to 1 per cent. is $25{,}000 - 5000 = 20{,}000$ cu.ft. per min.

Ques.—What are the necessary qualifications to make an efficient mine foreman, outside of those required by law?

Ans.—Beside the mining experience, necessary age and citizenship and the theoretical knowledge of mining principles, required by law, a mine foreman must be a good judge of men and the work they can do. He must be able to handle men so as to maintain the discipline of the mine and produce the daily tonnage at a reasonable cost of operation.

Ques.—In the case of an explosion of firedamp in which 8.4028 lb. of marsh gas are concerned, assuming that all of the hydrogen combines with the oxygen of the air to form water (H_2O); what weight of water vapor will result from this explosion?

Ans.—The chemical equation representing the reaction that takes place and the molecular weights of the several gases are

Reaction,	$CH_4 + 2\,O_2 =$	$CO_2 +$	$2\,H_2O$	
Mol.wt.,	16	64	44	36

Since the relative weights of marsh gas and water vapor concerned in this reaction are expressed by the ratio 16 : 36, the weight of water vapor formed is

$$16 : 36 : : 8.4028 : x = 18.9+ \textit{ lb.}$$

BOOK REVIEW DEPARTMENT

RESUSCITATION. A treatise on electric shock, traumatic shock, drowning, asphyxiation from any cause by means of artificial respiration by the prone-pressure (Schaefer) method with anatomical details of the method and complete directions for self instruction. By Charles A. Lauffer, medical director, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Penn. v + 47 pp. 4x6⅝ in.; 7 ill. John Wiley & Sons, New York. Cloth boards, Price 50c.

This little volume by the American apostle of prone pressure methods of resuscitation; should be read with care by first-aid men and by many others who possibly are not sufficiently well qualified to be entitled to that designation.

Dr. Lauffer is the author of a little volume on "Electrical Injuries." That book did not give such practical details of the prone-pressure method as does this little volume nor did it show the physiologic significance of the system of treatment. This brochure leaves the reader in no doubt as to just what is needed, and it certainly lines out a large field of usefulness for prone pressure. It is valuable to remember that it is available not only for electric shock and for asphyxiation by irrespirable atmospheres or by drowning but is to be recommended in all cases where a shock, such as a blow under the belt, on the jaw or neck or upon the head, has stopped ("inhibited") the movement of the diaphragm. Any shock which "knocks the breath out of a fellow" is a subject for resuscitating treatment if severe enough to need treatment of any kind.

The illustration on page 12 and the description of the bell-jar experiment are both unconvincing. The author could have used the figure in Hermann's "Physiologic des Menschen" with advantage as it is much more complete and illuminating. The other illustrations, which were prepared for another book, do not meet the needs of the author, but still if the reader does not become annoyed by the difficulties in pp. 11 to 22, he will arrive eventually at a clear conception as to the position of the floating ribs and the diaphragm and will comprehend the means by which the pressure on the former is transmitted to the latter.

THE ANALYSIS OF BLACK POWDER AND DYNAMITE—Bulletin 51. By Walter O. Snelling and C. G. Storm. 76 pp. and index. 5¾x9¼, 5 plates, 5 ill. Paper cover. Bureau of Mines Bull. 51.

The public has long been expecting this bulletin. Its slowness in publication is an evidence of the dilatoriness of the government printing press, overburdened with the duties of reproducing in sheaves the matchless eloquence of the national legislature. The authors have produced, as might have been expected, a careful monograph on the analysis of dynamite and black powder, the first explosive having both precedence and more lengthy treatment, despite the title of the brochure.

Messrs. Snelling and Storm have checked their work with a great deal of care and their methods on the same sample would give concordant results. But they themselves would be willing to admit that concordance and correctness are not synonyms. The figures obtained for moisture are possibly too high in so far as they are raised by the loss in weight, due to vaporization of nitroglycerin yet it is possible that they are too low because complete dessication may not be obtained in 3 days at room temperatures.

We wish now before the reader gets a wrong impression to declare that what is said about this matter, can be paralleled in speakjng of any proximate analysis. If we may be pardoned the pun, such a determination is usually not so "proximate" as it is "approximate." As A. C. Fieldner of the Bureau of Mines pointed out in his address before the Coal Mining Institute of America, the chief services of the chemist have been to render proximate analyses of coal concordant rather than determinatory of the actual proximate condition of the body tested. This is the extent of the work done in analysing dynamite. Rough indications are obtained of the moisture content and probably more accurate determinations are made of the quantity of nitroglycerin.

These results for any two samples of the same dynamite when in the same condition are made to check just as the traverse of a survey can be made corroborative of the accuracy of the measurements, even when the temperature of the uncompensated tape is known to be 100 or 105 deg. F. and the tape is only correct when the heat is less severe.

We cannot agree with the authors that moisture determinations of samples can be made with accuracy whenever atmospheric conditions are normal, seeing that the authors show that when the dynamite is stirred for 10 min. in an atmosphere 75 per cent. saturated, the determination is raised 14 per cent. higher than when the saturation is 19 per cent. The result at the lower saturation is equal to the correct moisture content according to the authors. Therefore the other result in an atmosphere 75 per cent. saturated must be too high and such a saturation of the atmosphere is fortunately for the mining industry, very common in the United States. Thus at normal saturations, the moisture content is apt to figure too high if the sampling is not executed with dispatch. The lower saturation is common in certain restricted parts of Colorado and the arid West and possibly is not uncommon in office buildings in the winter.

We do not wonder that the introduction of nitroglycerin into the dessicator produces no influence on the results. It is unlikely that the space in the apparatus is 100 per cent. saturated with nitroglycerin by this system. Moreover the fluid was introduced at the same time as the dynamite and could not have had any effect at early stages even if the vapor tension of nitroglycerin were abnormally low. But the experimenters appeared to have followed the recognized practice and amply showed that the introduction of nitroglycerin failed to modify the results.

It seems that a measurement of the increment in weight of the dessicating substance would give a more accurate determination than a reweighing of the dynamite if a dessicator were chosen which would not combine or dissolve nitroglycerin or nitrogenous fumes. Perhaps P. Litherland Teed's system of gaging the moisture in coal could be duplicated with dynamite and a slightly higher temperature of dessication adopted. The drying could take place in a vacuum, and the evaporated bodies drawn through a dessicating tube heated to a higher temperature than the dynamite so that they would not condense. The increase in weight of the dessicator would measure the moisture evaporated.

Nitroglycerin has the following formula, $C_3H_5(NO_3)_3$. There are other bodies known as nitro-substitution compounds $C_3H_5(NO_3)_2OH$ and $C_3H_5(NO_3)(OH)_2$. These bodies are formed in the manufacture of nitroglycerin and may not be wholly eliminated. Moreover there is a possibility that some nitroglycerin may replace a molecule of NO_3 with OH. It is to guard against this that the potassic iodide tests are made and the stabilizers are added. In case either of these less nitrified bodies were formed, a determination of the NO_3 content in the "nitroglycerin" of the dynamite will not connote the quantity of glycerin compounds. For instance, if it was all mononitroglycerin the result will be one-third as large as it should be. Of course the error would be normally small especially in a good article which has been well handled but it is not such dynamites which it behoves us to eliminate.

Doctors Snelling and Storm have prepared a bulletin of great value. The difficulties faced perhaps cannot be met by any refinement of method. It is not too much to hope that in a few years the shadow now thrown on the proximate analysis will be removed by the earnest work of enterprising chemists.

THE HISTORY OF THE E. I. DU PONT DE NEMOURS POWDER COMPANY. 224 pp., 6x9¼ in., copiously illustrated. "Business America," New York, Fabricoid boards.

The writer of this most readable and valuable record of powder manufacture withholds his name. The reader who follows his narrative from one end of the volume to the other will agree with him that he has recorded a century of success and will concede that he has made that success as interesting as it is remarkable. The du Ponts built their first mill in America in 1802 and since their venture commenced, the stories of powder and of the du Ponts have been identical. The book is essentially historical and does not venture on technical ground, but incidental reference is made to all the many lines, in which powder is used. Originally an instrument of war, it is today an important agent in every civil development.

COAL AND COKE NEWS

Washington, D. C.

Some interesting orders relating to rates on coal have been issued by the Interstate Commerce Commission within the past few days. One of the most important relates to an application which requested permission to establish a rate of $2.85 per gross ton on prepared sizes of anthracite coal all-rail from mines to various points in Massachusetts while maintaining a higher rate to intermediate points.

In the application it is stated that the New York Central & Hudson River R.R., in connection with its Boston & Albany division, is about to establish a rate of $2.85 to Allston and Newton Lower Falls. Dealers located at the latter points are in competition with those located at Newton Upper Falls, Needham, and Needham Heights, and it is stated that unless the New Haven road can name as good a rate to the points in its line these dealers will be forced to go out of business. Some time after the filing of this application the Commission was notified that the New York Central did not propose to put in the rate of $2.85, and that, therefore, the New Haven road desired to withdraw its application with respect to Newton Upper Falls, but desired to have the application stand with respect to Needham and Needham Heights.

It was also stated that coal reached Boston at a lower rate than the rail carriers published, and was carried from tidewater by automobile trucks to Needham and Needham Heights at a rate less than $3, and to meet this competition it was proposed to put in effect the rate of $2.85. The Commission denied this application under Fourth Section Order No. 230, stating that sufficient justification had not been shown for the relief sought.

Since then the Commission has conducted a hearing with reference to this application, at which the New Haven road and the hard-coal dealers of Boston were represented. Substantially the same reasons were advanced at the hearing as were set forth in the application, but with more detail.

The rail-and-water rate from the anthracite regions to Boston is $2.55; the all-rail rate $2.65. Coal dealers of Boston who receive coal by water at the $2.55 rate make deliveries by automobile trucks in the suburbs of the city, including Needham, Needham Heights and Newton Upper Falls, and the carriers allege that the present rate of $3 per ton is not sufficiently low to meet this competition, and the testimony so indicates.

In this connection there was also filed with the Commission applications setting forth the effect of water competition at Boston as justifying a lower rate than exists at interior points. In consequence the Commission has finally issued the following order covering the situation complained of:

Application No. 774 asks, among other things, for authority to continue to charge lower rates on anthracite coal from points in the anthracite coal region of Pennsylvania to Boston, Roxbury, Boylston Street, Forest Hills, and Mount Hope, Mass., and other points adjacent thereto taking the same rates, than the rates concurrently effective on like traffic to intermediate stations;

Application No. 5301 asks for authority to establish a rate of $2.85 per gross ton on prepared sizes of anthracite coal, all-rail, from mines in the anthracite region of Pennsylvania located on the rails of the Pennsylvania R.R. Co., the Central R.R. Co., of New Jersey, Philadelphia & Reading Ry. Co., New York, Ontario & Western Ry. Co., Erie R.R. Co., and Lehigh Valley R.R. Co., to Needham and Needham Heights, Mass., lower than rates concurrently in effect to intermediate points;

A hearing having been held upon these applications, in so far as they relate to rates on anthracite coal from and to the points hereinbefore described, and full investigation of the matters and things involved having been had, and the Commission having, on the date hereof, made and filed a report containing its findings of fact and conclusions theron, which said report is hereby referred to and made a part hereof:

It is ordered, That Fourth Section Order No. 230 be, and it is hereby, vacated.

It is further ordered, That the petitioners herein be, and they are hereby, authorized to continue to charge as at present lower rates on anthracite coal from points in the anthracite coal region of Pennsylvania to Boston, Roxbury, Boylston Street, Forest Hills, and Mount Hope, Mass., and other points adjacent thereto taking the same rates, than are concurrently in effect on like traffic from the same points of origin to intermediate points; and to maintain higher rates to intermediate points, provided that the present rates to said intermediate points are not exceeded; and provided further, that the rates to Needham, Needham Heights, and Newton Upper Falls, Mass., shall not exceed the rate to Boston, Mass., by more than 20 cents per gross ton.

The Commission does not hereby approve any rates that may be continued or established under this authority, all such rates being subject to complaint, investigation, and correction if in conflict with any other provision of the act.

The Prospects Are Good

According to all information received here, the prospect for Fall trade in coal is of the best. General trade during the summer, it is reported by those who are looking into the situation for the Federal Government, has been entirely healthful, while it is the opinion of the investigators that demand has on the whole been tolarably well supplied. The prospect however that Fall and Winter demand will add to prices for coal and the consequent necessity of filling orders early if all demand is to be gratified has, however, caused continuous anxiety on the part of those who do not wish to see the matter remain a political issue.

Representative Murray continues his demand for a thorough inquiry into the coal situation, with a special view to ascertaining why the requirements of Massachusetts have not been fully met and at lower prices. The general coal situation is causing in another way fresh demands for Government action as it is now insisted that the proposed Alaskan railway, to be built with public funds appropriated for that purpose shall be constructed at an early date in order that full advantage may be taken of this source of supply by shipments through the Panama Canal.

HARRISBURG, PENN.

The tri-district executive board of the anthracite region adjourned on Thursday, Aug. 21, after a lengthy discussion of plans to submit to the operators a demand that the "check-off" system be established throughout the region.

It is understood that sub-committees were appointed as part of a plan to submit the demand in the routine and orderly way, taking the matter up with the representatives of the companies with whom they have heretofore negotiated for the settlement of local colliery grievances.

The "check-off" system has never been employed in the anthracite region, though it is in force in the bituminous field of this state. Under its operation the companies collect dues from the members of the organization and turn the money over to the union officials. It has been indicated that the proposition will be opposed by the operators.

The importance of the demand and its far-reaching effects prompted National President White of the United Mine Workers to counsel delay, and is deemed responsible for his message, received shortly before adjournment, saying he would confer with the board at its meeting in Shenadoah during September. It is intimated that, pending the arrival of the head of the organization only a perfunctory demand will be presented, through the usual channels, the outcome to determine future action.

The Lenker dockage bill was also discussed at the meeting. The most salient features of this bill are the provisions which declare that the operators shall not dock the men for refuse, which is part of the natural formation broken down with the coal, and that the cars must be accounted for inside the mine instead of at the breaker or other outside points. The bill, however, provides that practices already in vogue will not be affected and that agreements may be entered into between the operators and the miners regarding the latter point. The enforcement of the law is being opposed by the operators on the ground that it interfers with existing agreements. The miners' leaders themselves are not particularly anxious to push this measure, as it threatens to annul some of the advantages which the men now enjoy.

Action Against Mine Cave Bill

The action instituted in the Scranton Courts against the "Davis Mine Cave Bill" was not unexpected, as this measure has a vital bearing upon the future mining of anthracite coal. The Davis bill is far less drastic than the Catlin bill, which was vetoed by Governor Tener. The Davis Bill provides that municipalities shall have the right to regulate mining under the highways for their protection. Since the highways cover a large part of the area of a municipality that safeguard is of considerable importance. In order to protect the highawys it would be necessary to leave surface

support under adjoining property to prevent lateral sliding. In that case a large part of the private property in a municipality would have to be protected in order to carry out the provisions of the bill.

The controversy is different from that involved in the protection of private property from cave-in damages, as the public can claim rights and immunities which a private person may not urge. The highways are used by public utilities for running street cars, wires, gas and water pipes, etc., and in view of this the bill may be sustained.

There is a possibility that the courts may decide that surface support must be provided under streets that were laid out and accepted before the coal under them was secured and mining begun, but that the municipalities took the risk when they laid out the streets over coal that had already been contracted, with a waiving of damage claims.

The remedy proposed by the Mine Cave Commission appointed by Governor Tener has fallen flat. All that remains is a decision of the Supreme Court denying property owners the right of redress in case of damage. There is a strong sentiment through the region that the Commonwealth should invoke the police powers, but a suit along these lines has never been tried out in the courts.

PENNSYLVANIA

Anthracite

Hazleton—The miners of this region are making a determined effort to have President Kennedy of the district union appointed to membership on the board of trustees of the State Hospital. A mammoth petition is being circulated, for this purpose, and pressure is being brought to bear upon Governor Tener to make the appointment from among the miners.

The Dodson Coal Co. has posted notices at its Beaver Brook Colliery stating that work will be suspended until further orders, and thus about 1200 men and boys are idle. This is the first time that the colliery has been idle in the past eight years, and many of the men claim that the shutdown was ordered because the employees had intended to start a button strike.

Scranton—Seven hundred miners went on strike recently at the Peckville colliery of the Laskawanna Coal Co., because the company contracted with outside men for the removal of pillars. The officials of the union tried to prevent the men from walking out because such action is in violation of the agreement signed with the operators. The vote to strike was unanimous. The agreement between the mine workers and the operators makes it imperative that the companies pay a certain minimum wage for the removal of pillars, but does not state that the work must be done by the members of the miners union.

Wilkes-Barre—What promises to be another important lawsuit is the tresspass action filed by the trustees for the proprietors of Kingston Township against the Kingston Coal Co., in which $300,000 is asked in damages for coal mined under land in certain sections of the township. The case is similar to that of the trustees for the proprietors of Kingston Township against the Lehigh Valley Coal Co. for mining coal under 34 acres of land in Forty Fort, for which the township secured a verdict for $101,000, and a retrial of which has been ordered by the Supreme Court, and which suit comes up in October. The suits date back to 1769, nearly 150 years ago.

Carbondale—Sinking to his waist line while playing in the vicinity of the Watt-Scurry mine fire zone, a six-year-old boy was nearly burned to death when the crust caved beneath him. This tract has been ablaze for the last 10 years, and an appropriation was made by the last legislature to extinguish it, but Governor Tener vetoed the measure.

Shamokin—Alaska Colliery, of the Philadelphia & Reading Coal & Iron Co., is showing signs of being flooded and has been shut down until further notice as a protection to employees. The condition has arisen because a fire is burning in the Enterprise mine, further down stream. To quench this Shamokin Creek was turned into the Enterprise slope, and it has been discovered the water was escaping through the 50-ft. barrier pillar which separates the two mines. Danger exists of a sudden flood sweeping through all the Alaska workings, and it is not practical to keep pumping the water, for it must go into Shamokin Creek, and thence into Enterprise mine again.

Bituminous

Latrobe—Robert McGinnis of East Latrobe was killed by an explosion of dynamite in front of Superior Mine No. 1 of the Latrobe-Connellsville Coal Co. on Aug. 21. He was carrying a quantity of dynamite and caps and also had a battery in the package. Just how the explosion was caused is not known.

Kittanning—The Allegheny River Mining Co. has discovered two veins of coal which are considered to be unusually thick on the Fleming Farm in East Franklin Township. Some time ago a seven-foot bed of coal known as Upper Kittanning was found on this farm and lately at the same place, an eight-foot bed of Lower Kittanning was discovered.

Morrellville—E. W. Tuge, of Johnstown has opened a new mine at this place.

Carnegie—The coal industry in this vicinity is brisk this summer and almost every mine in the Chartiers Valley and the Panhandle district is beiog pushed to its utmost capacity to supply the demand for coal from the Northwest and Canada. The prospect now indicates steady work throughout the entire Fall and Winter.

Punxsutawney—Coal is once more being taken from the old No. 7 mine at Horatio which was abandoned two years ago. This coal is being taken from the fanway and is being mined at the rate of about a car load per day. Six or seven months will be required to finish up.

WEST VIRGINIA

Charleston—The case of J. H. Kidwell versus the Piney Mining Co. was decided by the arbitrators on Aug. 21. The decision reached by the Board of Arbitration was to the effect that miners should be paid at least twice monthly, that is: That the wages of employees earned up to the 15th of any month shall be paid in full not later than the last of the same month.

That miners in the New River fields who struck pending the adjustment of a grievance are violating the contract made with the operators July 1, is the substance of a statement recently made by Governor Hatfield. Several New River operators called upon the Governor and made complaint that at several mines the men refused to work pending the arbitration of their claims of unjust treatment. The Governor points out that one of the clauses of the agreement provides that miners shall remain at work pending the settlement of a controversy.

Bluefield—The Winding Gulf Colliery Co., has just opened a new shaft and tipple at Winding Gulf on the White Oak branch of the Chesapeake & Ohio R.R. The shaft is the only one on Winding Gulf, all other mines in that field being worked by drift. The steel tipple has a capacity of 2000 tons in eight hours, is equipped with the most modern machinery including automatic cut-off and self dumping cages. Electric power is furnished from another plant on the Winding Gulf.

TENNESSEE

Covington—The city of Covington has filed with the Interstate Commerce Commission a complaint against the Illinois Central R.R., in which it is represented that the railroad discriminates unjustly against Covington in the matter of freight rates on bituminous coal from Beaver Dam, Central City and western Kentucky points. It is alleged that the rate from western Kentucky mines to Memphis is $1.10 a ton, the shipments passing through Covington, which is 38 miles closer to the mines than the larger city, although the rate to Covington is $1.35 a ton. An adjustment is asked.

KENTUCKY

Hazard—Hazard is working hard for the proposed government hospital which is to be located in that section of the state to aid in the treatment of trachoma, which has become prevalent in several of the mountain counties. The growing importance of the city as a coal-mining center is expected to weigh heavily in its favor, as the disease is said to be economically important on account of its effect on industrial workers.

Pineville—The offices of the Wallins Creek Coal Co., which have been located at the mines in Harlan County since the company was organized, have been moved into Pineville, in charge of F. D. Wood, president, and S. G. Gray, secretary-treasurer of the company.

OHIO

Columbus—Smith M. Comley, receiver for the Carding Coal Co., of Columbus, has filed a report with the court showing receipts of $22,148 and disbursements of $19,503, leaving a balance of $2645 to be distributed among the creditors.

McArthur—Dayton Dickson has leased the coal rights on the Dana farm, near this place, and will start at once to drive an entry to develop the property which contains a good vein of coal.

Athens—Steps are being taken by the residents of Athens and vicinity to stop the flow of poisonous mineral waters from

Bellaire—The largest tipple in this county is in course of construction at the No. 6 mine of the Rail & River Coal Co. a few miles west of this city. During the improvement at this mine which is a part of the large improvement now being effected, the mine is idle and will remain so until all outside work is completed. It is thought it will be the 1st of September before this is done.

INDIANA

Linton—The Monon Coal Co. will sink a new shaft six miles southwest of Linton.

Sullivan—Unofficial announcement has been made that the Vandallia Coal Co. will take over the holdings of the Sunflower Coal Co. near Dugger and will open up a number of mines which have been partly abandoned.

Petersburg—After five months of steady pumping the S. W. Little Coal Co. owner of the Blackburn Mines which were flooded during the March freshet has cleared the mines of water and they will be opened early in September with the employment of something over 300 men. The Hartwell mine in the southern part of the county after an idleness of several years will also open about the same time giving employment to about 250 men.

Indianapolis—Jacob P. Brown, smoke inspector, is trying to induce the railroads owning round houses within the city limits to follow the practice recently started by the New York Central Lines at the Chelsea round house of firing locomotives with coke and oil soaked shavings instead of coal. Since the new system of firing has been started at the Chelsea St. round house conditions have been improved greatly and the smoke inspector says that he has received no complaint from persons residing near the place.

Jasonville—It is said that the Island Valley mine of the United Fourth Vein Coal Co. will resume operations shortly. This mine has been closed since March. It is one of the best equipped mines in this field and gives employment to about 200 men.

ILLINOIS

Springfield—The Jefferson mine, which has been closed for some time, will reopen soon, as a force of men are at work cleaning up the same. This mine is located southeast of Springfield and is the property of the O'Gara Coal Co.

Livingston—The mine known as No. 1, of the New Staunton Coal Co., located at Livingston, Madison County, Ill., made the following daily hoisting averages since July 1, 1913: July 1 to 15, 4132 tons; July 15 to 31, 4179 tons; Aug. 1 to 15, 4200 tons. The above mine produced 848,715 tons of coal from July 1, 1912, to July 1, 1913, and from the present indications this is the largest production for the year and it is believed the largest amount of coal ever produced from one mine in Illinois in a year.

Cardiff—The village of Cardiff will soon pass out of existence. The owners, the Cardiff Coal Co., have sold the various mine buildings including the tipple, to R. W. Powell and Fred G. Snow, who will remove them to Kankakee. The mine has been closed for several years following an explosion of gas in which a number of miners lost their lives. The bodies of these men are still in the mines.

Chicago—The first National coal trade Golf Tournament will be held at the Homewood Country Club on Sept. 8 to 10, 1913. Make your entry as early as possible.

IOWA

Des Moines—The Norwood-White Co. of Des Moines is opening a new mine at Burwick, Ia. This will be electrically equipped and will be one of the largest in output in the state. Power will be purchased.

ALABAMA

Birmingham—The Maryland Coal & Coke Co., which recently began operating on a large tract of land in the Sipsey Valley on the Black Creek Seam, reports that it is getting about 400 tons per day, which will be increased to 800 tons by December.

ARKANSAS

Russellville—A Coöperative Co. has been formed for the purpose of working the old Humphrey-Smith coal mine north of Russellville after an idleness of several years. The new concern will be known as the Acme Anthracite Coal Co., and will operate the mine under lease.

Midland—The Mammoth Coal Vein No. 6 located at Midland has resumed operation after being idle for a period of 18 months. This mine has given employment to over 40 miners and its resumption is welcome news to Midland.

TEXAS

Flatonia—A lignite deposit has been discovered on the H. H. Harrison farm, three miles north of the city. The discovery was made during the sinking of a well at a depth of 23 ft., the deposit proving to be five feet thick. Mr. Harrison at once made investigations relative to the area of the deposit and a number of wells were sunk at different places. This showed that there are about 20 acres underlain with lignite of a workable thickness.

San Antonio—Two beds of what is said to be a hard grade of bituminous coal are reported to have been struck on property belonging to the McMullen Townsite Co. One vein 40 ft. below the surface is 15 ft. thick. The other lies 80 ft. down and is five feet thick, both, however, are considered paying veins. The property is situated only 12½ miles from Crowther where there is oil in paying quantities.

COLORADO

Trinidad—An indorsement of the efforts now being made by the United Mine Workers of America to procure the recognition of the coal operators in District No. 15 was embodied in an emergency resolution passed by the Colorado State Federation of Labor Aug. 19.

WASHINGTON

Kopiah—Fifteen men are now at work on the 200 acres of coal land recently bought by the Monarch Coal Co. on the line of the Eastern Railway & Lumber Co. and one mile west of Kopiah. The management is erecting bunkers and putting in switching facilities and expects to be shipping 100 tons of coal per day as soon as these improvements are completed, which will be inside a month.

Mendota—Much development work is being done at the old mine here and new timbers are being put in place. The mine has been idle for a number of years but much money is now being spent in development work, under new ownership.

Spokane—The Mcgillvray Creek Coal & Coke Co., having its headquarters in Spokane marketed 135,912 tons of coal during its last fiscal year, according to a report just issued by E. W. Cullen, secretary of the company. The mine worked 256 days. The product was sold in Alberta, Saskatchewan, Washington and Idaho. In addition to this quantity sold, 264,650 tons were made ready for immediate production.

Harrington—In drilling a well at Harrington, Wash., Bart Schmidtz has encountered a large vein of high-grade coal. Further developments will be made.

OREGON

Portland—The Monarch Coal Co., of Portland, which has just begun the development of a mine eight miles east of Centralia, Wash., in the Hannaford Valley district, expects to take out 50 tons of coal daily after Oct. 1. The spur is now being built to the mine and bunkers are being constructed. The tunnel is driven where the coal outcrops and hence the operation is not a difficult one. The coal is soft and of good grade.

Coos Bay—Smith-Powers mine, recently opened, is on Isthmus Inlet, a navigatable arm of Coos Bay, and the management can load direct into vessels or on cars. The mine is equipped with electrical machinery, for mining and handling the output, and is prepared to supply coal cheaply. The mine is owned by the C. A. Smith Lumber Co.

FOREIGN NEWS

Vancouver, B. C.—John Place, socialist member of the British Columbia parliament, Arthur Jordan, secretary of the Naniamo coal miners local, and Joe Angelo, leader of the foreign element in the strike at Naniamo, were arrested Aug. 18 with about 40 other men implicated in the strike disturbances.

PERSONALS

At a meeting of the directors of the Maryland Coal Co. of West Virginia, President Ziegler proffered his resignation which was accepted.

Jones Moore, one of the best known coal men in the Birmingham District, has announced his candidatecy for sheriff of Jefferson County, Alabama.

A. Kauffmann, formerly assistant to the president of the Link Belt Co., has been made General Manager of the Philadelphia Works at Nicetown, Philadelphia, Penn.

H. McKean Conner, who recently has been general superintendent in charge of all operations and engineering for the Continental Coal Corporation has severed his connection with that firm.

H. N. Starnes, Jr., has been appointed general sales agent of the Tune Coal Co., mines at Carbon Hill, and the John Henry Coal Co. mines at Jasper, and has opened an office in the American Trust Building, Birmingham, Alabama.

Thomas H. Shaw recently closed down Mine No. 1 on the Smedley lease near Midland, Ark. This mine was in a dangerous condition with poor air supply, and several practices being pursued which were in open violation of the state laws.

George Best for 12 years president of the Best Manufacturing Co. has severed his connection with that concern, and with his son, George H. Best, has organized the Best Pipe Engineering & Supply Co. The office of the new firm will be at No. 3026 Liberty Ave. Pittsburgh, Penn.

CONSTRUCTION NEWS

Hynes, Iowa—The Smoky Hollow Coal Co. is sinking a new shaft at Chisholm, Iowa. This will be Mine No. 9.

Peoria, Ill.—It is announced that the Big Creek coal mine plant, recently destroyed by fire, will be rebuilt at once.

Sharon, Penn.—The Shenango Furnace Co., operating three blast furnaces at Sharpsville, has acquired recently considerably more land near its property. This is taken as further proof that a big coking plant is to be erected soon.

Bluefield, W. Va.—The new all-steel coal tipple which the Jewell Ridge Coal Corporation, of Richlands, is erecting at the head of Big Creek, is expected to be complete about Sept. 1. This is one of the most modern and uptodate coal mine equipments in the Clinch Valley district.

Stone, Ky.—Colonel L. E. Tierney, of the Tierney Mining Co. at Stone, Ky., has awarded to the Link Belt Co. of Philadelphia, the contract for a complete tipple equipment and retarding conveyor. This equipment is especially complete in all respects and practically every combination of the various coals as well as the separate sizes can be produced.

Cordova, Ala.—The Oak Leaf Coal Co., began grading on Aug. 18 a three-quarter mile extension of track preparatory to making two new openings into the main body of its coal. The two openings will be on either side of the valley, and connected by a twin tipple. It is believed that this work can be sufficiently completed to run coal from both openings by the first of the coming year.

Weyanoke, W. Va.—The Weyanoke Coal & Coke Co. is putting in the concrete foundation for a new tipple. This tipple, which is to have a capacity of 1500 tons per day, is to take the place of the present structure, which is no longer able to handle the increasing tonnage. This coal company has 1150 acres of land in Mercer County on the famous Pocahontas No. 3 seam, which so far as developed in this property averages 4½ ft. in thickness.

NEW INCORPORATIONS

Pittsburgh, Penn.—The Pennsy Coal Co. and the Buckingham Coal Mining Co., of Franklin, Penn., have been consolidated into one organization, known as the Pennsy Coal Co.

Chicago, Ill.—The Illinois Commercial & Mining Co. has been recently organized to deal in coal, coke and other products. The incorporators are Geo. J. Clare, Edward Corlet, and others.

Chicago, Ill.—The Middle States Coal & Coke Co. has been organized with a capital stock of $10,000 to engage in the mining and sale of coal. The incorporators are Geo. N. Beek, Wm. G. Beek, and F. D. Brenner.

Indianapolis, Ind.—The Otter Valley Coal Co. has been organized with a capital stock of $100,000 to mine and sell coal, and other minerals. The directors are Wm. B. Smith, Wm. E. Lenton, and Lauren A. Hilligoss.

INDUSTRIAL NEWS

Hobson, Ohio—The Calvin-Essex Coal Co. has just closed a contract with the Roberts & Schaefer Co. for equipment for a 200-ton per day modern tipple, which will be immediately built at Hobson.

Philadelphia, Penn.—The Lehigh Coal & Navigation Co., which operates canals in eastern Pennsylvania in connection with its coal properties, anticipates the purchase of 21 steel canal boats. These will be about 90 ft. long and will weigh 70 to 75 tons each.

Kempton, W. Va.—The Davis Coal & Coke Co. plans to open a new mine at Kempton and equip it for a daily capacity of 1500 tons. The development will include the construction of a mining town and a ¾-mile branch railroad from the Western Maryland, from Henry to Kempton.

Uniontown, Penn.—George F. Titlow, of this place made a profit of $50,000 on a coal deal recently consummated. A tract of land, which consists of 261 acres on Roberts Run in Wayne Township lying in Greene County was purchased by Titlow eleven years ago for $13,500 and sold for $65,000.

Connellsville, Penn.—Fire on the night of Aug. 20 did some slight damage to the coal tipple in the Baltimore & Ohio yards. It first started about nine o'clock and was supposedly extinguished, but revived again about eleven, when the city department was called out. The damage done was not great.

Camden, Ark.—Dr. George W. Kimball, of Chicago, who discovered the vast lignite and clay deposits in this county, is erecting a factory in the suburbs of this city for the manufacture of byproducts from the lignite. Among these byproducts are a fireproofing fluid, a strong creosote oil, a high grade of carbon, and a number of medicinal chemicals.

Patton, Penn.—Interest surrounds the activity of the Manor Real Estate and Trust Co., which has taken an option on a 400 acre tract of coal extending from Patton to Frugality. The tract is situated in the Beaver Run field which has been the bone of contention for a long time between the New York Central and Pennsylvania R.R. Both roads have easy access to this district by the construction of short spurs of track.

Washington, Penn.—A miner charged with changing coal checks in the Marianna mine of the Pittsburgh-Buffalo Co., recently had the unusual experience of having the presiding judge in his trial act as his attorney. The foreigner had no counsel. No attorneys were present in the court room and the judge stated he would act not only as judge but counsel for the miner. The Court cross-examined witnesses, and after hearing the evidence the jury acquitted the defendent but placed half the costs upon him.

Connellsville, Penn.—The Interstate Commerce Commission has issued a second supplemental order in connection with the decision of May 29, in the case of the Connellsville Coke Producers Association against the Baltimore and Ohio and other roads. The decision is modified to the extent that it relieves the Baltimore and Ohio and the Erie from maintaining a rate of $2.30 a ton on coke from the Connellsville region to Newark, by way of Mount Jewett, and leaves in effect the old rate of $2.35 a ton.

Morgantown, W. Va.—The Morgantown & Kingwood R.R. has closed a deal by which it has leased from the Central Iron & Steel Co. 40 big steel hoppers for use in transporting both coal and coke. These cars have been delivered at the company's Sabreton shop and are now being restenciled with the railroad name. The cars are of extra large size, and will be a material addition to the road's rolling stock. The leasing of extra cars was made necessary by the increase in output of the Elkins mine, the company shipping a considerable amount of coal to the East.

Bremerton, Wash.—Tests of Alaska coal are to be conducted abroad the armored cruiser "Maryland." If the results prove that the Alaskan coal is of a steaming quality sufficient for the needs of the navy it will result in the saving of hundreds of thousands of dollars every year. At the present time, coal used in the boats on Pacific waters is shipped around Cape Horn from Norfolk, Va. The supply for the tests has been obtained, and the coal is available at Controller Bay. This coal, which is now being tested, was mined in the Bering River coalfield, brought on sleds over snow and ice to Bering River, where it was transported to the coast on light barges. The mining was done under the direction of experts from the Bureau of Mines.

COAL TRADE REVIEWS

GENERAL REVIEW

Hard coal uniformly dull except for water shipment out of New York Harbor. Some storing and no immediate improvement anticipated. Bituminous quiet but showing no weakness. Heavy production being well absorbed. Increased pressure for coal from the Northwest. Prices firm.

The demand for water shipments of hard coal out of New York harbor is the only active branch of the anthracite trade. Down East points, particularly those where navigation closes, are taking all the possible coal they can get. Otherwise the trade is dormant and orders are difficult to obtain. Some of the smaller sizes are going into storage, including pea, although indications are that there will be a severe shortage of this latter grade within sixty days.

The abnormal tension in the bituminous market has been materially relieved, although no important weakness has developed except possibly on occasional odd tonnages of the off qualities. The export business is falling off, but coastwise shipments are heavy and the West Virginia coals are moving forward in a good volume. Most of these tonnages are applied on contracts, but some companies are actively seeking an outlet for odd lots of prompt coal and as a result the demand has slacked off. Vessel tonnage is scarce, due to the continued heavy movement of anthracite. Prices are holding up well, particularly on the better grades, which are showing a stiffening tendency, but there is rather less inquiry than has prevailed.

Increased pressure for coal, due to the heavy demand from the lakes, has been the feature of the Pittsburgh market. Prompt tonnages can be obtained only at a substantial premium, and there appears to be little available even then. The car and labor shortage are steadily becoming more severe, and as a result the market is maintaining its full strength without any difficulty. Loading at the Ohio docks is up to full capacity, and both the steam and domestic grades are strong. Quotations have stiffened up still further on reports of a further tightening in the car situation, the inadequate supply of which is also interferring with the lake shipping to some extent.

The movement of coal through Hampton Roads has been heavy, but prices continue firm at the previous level with some agencies still short. There has been a large demand from the foreign trade and also in the New England markets. The railroads in the South are storing heavily in anticipation of an acute car shortage, the situation already being so tight that production is seriously curtailed. The demand for both steam and domestic fuels is excellent, and prices as a whole are entirely satisfactory. Business in the Middle Western markets is improving generally, and prices are better maintained. The car shortage, which had a noticeably stimulating effect upon the market is materially improved, but still rather severe. The September circular will probably show some further advances.

BOSTON, MASS.

Hampton Roads coals easy at the season price, but no prospects of any concessions. Consumers are taking tonnage liberally and will continue doing so until stocks reach the maximum. Little interest in spot coal. Pennsylvania grades less firm and Georges Creek in better supply. Anthracite market in good shape; another "advance" rumored.

Bituminous—Aside from small local labor troubles in the New River district the situation is generally easy with regard to supplies for September. The West Virginia coals are coming forward in such volume that the demand for other grades is beginning to slacken. Several shippers are actively seeking business for spot coal but buyers are rather slow responding. With the market so quiet it is hard, in late August, to get up much enthusiasm and when the $2.85 figure is considered over against the $2.70 of a year ago the operating and selling interests have much to be thankful for in the course of the season's business thus far.

There are few weak places in the price situation; while now and then are heard rumors of 5c. less than the contract price for Pocahontas and New River, they are usually traced to the less favorably known operations, and sales have been made within a week at $2.90 f.o.b. Receipts at this end continue heavy but with not as much effect on car prices as was looked for. So far most of the tonnage has been applied to contracts and no doubt will continue so until stocks are well beyond what New England manufacturers have come to regard the safe point, which means the utmost they can store. That keeps the larger agencies well supplied with orders for some weeks to come and close observers will be much surprised if they are not enabled to go through the next two months with $2.85 a reasonably firm price.

Georges Creek shipments to tide have been heavier the past week than at any time this year and the sales offices are quietly looking over the market to see where it shall go. One of the factors in placing this grade as well as those from Pennsylvania is the unexpected dearth of barges for Philadelphia loading. The demand for anthracite keeps up so well that almost no water transportation is being released to the bituminous trade, and that acts as a setback to shipments of those coals to this market.

Prices on the Pennsylvania varieties continue firm but with rather less inquiry than a week ago. Quotations on all grades are somewhat off but operators still profess to be apprehensive over labor and car shortage during late fall and winter. All-rail the trade is brisking up a little and the outlook for September is favorable.

Anthracite—The companies appear to have ample business in hand for current output and the Eastern ports that close to navigation in late November are showing a renewed interest in getting supplies forward. The steam sizes are also in good request and the trade as a whole seems in excellent shape. There are rumors once more of an advance in the company barge rate from New York to Boston points. For 15 years or more this has been fixed at 50@55c., depending on the loading port, and if this charge is increased it will be still another of the many "lifts" the New England trade has had to meet the last few years. It will be interesting to see how this phase develops.

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$1.15@1.50	$1.35@1.65	$1.67@1.77	
Philadelphia*	2.40@2.75	2.60@2.90	2.92@3.02	
New York*	2.70@3.00	2.90@3.20	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				$2.85@2.90
Boston†				3.80@3.85
Providence†				3.90@4.00

*F.o.b. †On cars.

NEW YORK

Soft coal dull but not weak. Some large railroad contracts pending. Production heavy. Demand for water shipments out of New York Harbor the only active branch in hard coal.

Bituminous—The softening tendency noted in our last report still continues, although without having developed any direct weakness. Consumption continues large, the demand heavy and operators generally are pushed to meet their contract obligations. The market is temporarily dull but not weak. Several important railroad contracts involving large tonnages are still pending and continue to be one of the principal features in maintaining the market; indications point to the railroads being important buyers in the spot market, as has been the case during the past few years.

There is not much coal at tide and business there is also slow. In the line trade orders are coming in more freely. Car supply as a rule is fairly good, only occasional shortages being reported at some sections on the Pennsylvania R.R. The insufficiency of miners is one of the greatest uncertainties in the market at the present time. Not only are men scarce and difficult to obtain, but production has been further restricted by a seemingly unprecedented succession of holidays, such as "Old Home Week," Labor Day and religious holidays, not to mention countless picnics, county fairs, etc.

Production is up to full rated capacity with the exception of some small tonnages which the producers have refused to place in the contract market, keeping these free for use in the spot market during the winter activity; such tonnages are necessarily difficult to move at present and require a certain restriction in production. We now quote the New York soft-coal market on the following basis:

West Virginia steam, $2.60@2.65, fair grades of Pennsylvania, $2.70@2.75; good grades of Pennsylvania, $2.80@2.85;

best Miller Pennsylvania, $3.10@3.20; George's Creek, $3.15@3.25.

Anthracite—The trade locally is dormant, there being little activity in anything except stove, the demand for which is only moderately good. Mines are only working four to five days a week and it is a question at the present moment when the situation will improve, but certainly not before there is some evidence of cold weather. The consumption is not sufficient to absorb the production and orders are difficult to obtain, particularly by those agencies who are charging the new Pennsylvania State tax on hard coal. Pea and buckwheat are going into stock, but it is expected that the winter will see pea one of the short, if not the shortest sizes.

One of the most encouraging conditions in the local hard-coal market is the heavy demand for all grades from down East points. Shipments in that direction are running well ahead of last year, for this same period, but this does not give a consistent comparison for the reason that shipments were light last year, due to the strike. However it is indicitative of a heavy shipment into that section. In anticipation of the suspension the first part of next week, due to Labor Day, the mines will probably be pushed for a little larger production, than has been the case for several weeks past, when it was found necessary to restrict the output.

We quote the New York market on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken	$4.90	$4.90	$4.85	$4.85
Egg	5.15	4.95@5.15	5.10	4.90@5.10
Stove	5.15	5.15	5.10	5.10
Chestnut	5.40	5.25@5.40	5.35@5.15	5.35
Pea	3.50	3.35@3.50	3.45	3.30@3.45
Buckwheat	2.75	2.50@2.75	2.45@2.70	2.15@2.60
Rice	2.25	2.25	1.95@2.20	1.70@2.20
Barley	1.75	1.75	1.70	1.30@1.70

BALTIMORE, MD.

Export business has fallen off, but coastwise charters are numerous. Slack and coke both show advances, and the rest of market is holding firm. Car shortage becoming more acute. New mines to begin shipping soon.

That August will show a decline in the amount of export business seems undoubted, as the past two weeks has seen a considerable let up in the number of charters announced for foreign delivery. On the other hand, the domestic coastwise trade is in excellent shape and all the piers here have been busy with loadings both north and south. Charters announced the past week for the coast trade include a number to Boston and other points Northeast while Southern charters are principally to Savannah, Galveston and Port Tampa. There has been some talk that the drop in export figures is attributed largely to the unsettled state of affairs in Mexico, which may have curtailed the coal movement in that direction.

The principal features of the local market for the week have been slack and coke, both of which have strengthened. Slack was selling at the mines easily at from 80 to 85c. West Virginia coke, under an increasing demand, has risen to from $2.20 to $2.50, and Connellsville grades are quoted at from $2.40 to $2.65. The balance of the coal market has held firm, and, indeed, some of the better grades are scarcer than ever. A growing car scarcity has not been conducive to an easy supply. While there have been days when cars were fairly plentiful, there were also periods when few, if any, were delivered.

That the producing end is satisfied that good times are ahead is shown by the rapid opening of new properties. Following the announcement that Hite and Rafette will open a new mine in West Virginia on the line of the Western Maryland R.R., comes the statement that the Elkhorn Fuel Co. leases will begin first shipments from the Kentucky properties of that corporation within the coming month.

Anthracite business is slowly showing increased signs of activity. There is plenty on hand of all grades, however, and the main business just now is in rounding out affairs for the fall trade.

PITTSBURGH, PENN.

Mines working at full capacity, with fair supply of labor and cars but fears of car shortage later. Hardly any free coal available, and then only at premiums. Slack output well absorbed. Slight flurry in Connellsville coke quotations, market righting itself later. Production and shipments slightly increased.

Bituminous—The pressure upon the mines has slightly increased, the Northwest apparently being ready to take all the coal that can possibly be shipped. Car shortage has also increased, and while no serious difficulty is expected it is recognized that the capacity of the railroads will be tested throughout the next two months. Labor supply is fairly good, and Pittsburgh district mines are working practically at capacity, and turning out very close to the maximum tonnages ever reached.

Free coal can be secured only in exceptional cases, and on a few divisions, commanding substantial premiums in such cases, while contracts cannot be closed at regular prices except for shipment beginning not earlier than Nov. 15 or Dec. 1. Slack is usually bringing the full season price, concessions being light and obtainable only on a few divisions. We continue to quote regular prices as follows: Slack, 90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in. steam, $1.50; 1¼-in. domestic, $1.55 per ton at mine, Pittsburgh district.

Connellsville Coke—A little flurry was caused early in the week by a prominent merchant firm offering furnace coke for spot shipment at various prices from $2.40 down to $2.25, presumably with a difference in quality. This was in a market of no absorbing power, and it appears that none was sold. Later demand appeared and the best that could be done was $2.50, which was paid on about 2000 tons for shipment over the balance of the month, so that the market is regarded as well established as at any time.

The next demand of importance will be for September, from a few furnaces not already covered, and there seems to be little question that this will be covered at the full price. In view of the further declining tendency of prices in the steel industry, making improbable any important advance in pig iron, a fresh question is raised as to whether the $2.50 price on Connellsville furnace coke can be indefinitely maintained. We quote: Prompt furnace, $2.50; contract furnace, $2.50; prompt foundry, $3; contract foundry, $3, per ton at ovens.

Production in the Connellsville and lower Connellsville region in the week ended Aug. 16, as reported by the "Courier," was 398,617 tons, an increase of 3792 tons. Figures for recent weeks have shown a slight progressive increase, though blast furnace operations have been on the decline. The coke rate is now only some 25,000 tons below the average rate in the earlier months of the year.

BUFFALO, N. Y.

The unusual strength in bituminous continues unabated. Car and labor shortage the two worst features of the market. Prices firm with occasional premiums offered. Heavy shipments of hard coal up the Lakes.

Bituminous—The market shows undiminished strength with many sales being made at a premium which is an unusual condition at this time of year and is accounted for mostly by the heavy lake business. Were it not for the scarcity of miners the operators would have little to complain of, but coupled with the large demand there is also a curtailment of output. Advertising for men and solicitation in the labor markets, generally meets with little success. More is being heard right along of a scarcity of cars, especially gondolas. The railroads are cautioning their patrons to keep cars moving and not to use them for storage purposes. The outlook is for a tie-up of motive power and equipment this winter and a consequent difficulty in moving coal. From now until the arrival of cold weather an increasing car shortage is looked for. From the extent of contracting during the summer, it is apparent that buyers wish to be sure of coal this fall and winter.

Bituminous prices remain strong and sometimes reach a premium, the quotations being as follows: Pittsburgh lump, $2.90; three-quarter, $2.80; mine-run, $2.65; slack, $2.15; with Allegheny Valley about 15c. lower.

Coke—The coke market is firm, with a somewhat better demand on account of the starting up of furnaces. Nevertheless, the trade cannot be called active in this territory. Quotations remain on the basis of $2.65 for best Connellsville foundry.

Anthracite—There is only the usual quiet midsummer trade in hard coal. Retailers apparently will not buy in any quantity until the weather becomes colder. Their supplies continue fair, but with the approach of chilly weather there will no doubt be the sharp demand that is almost always present. The main outlet for coal is up the lakes and that trade is continuing on a large scale. August is likely to run almost equal to the unprecedented figures of July, and may possibly exceed them. For the past week the shipments dropped off as compared with the previous week, but at the same time the total was large, amounting to 158,000 tons.

TOLEDO, OHIO

Loading docks for Lake coal being worked up to full capacity. Car supply fair so far. Domestic trade good. Prices strong and will probably increase as the season advances.

The coal trade continues active in Toledo especially at the

docks where machinery and men are having difficulty in taking care of cargoes. During the week just past 154,590 tons of coal passed through. Thus far in the month of August more than 700,000 tons of coal were sent to the up-lake ports from Toledo. The demand for steam coal continues undiminished and Pocahontas is also very strong and is improving steadily.

The traffic situation here is the best and no complaints of car shortages have been heard although railroads are occasionally asking dealers to take hopper cars. This is only in occasional instances, however, and has not by any means become general. Toledo dealers are somewhat opposed to the hopper cars as they are not equipped for unloading this class of cars and find themselves at a disadvantage. Rumors of car shortages are heard now and then from the north but have not as yet reached an acute stage even there. Toledo is exceptionally well equipped for taking care of traffic which will in a measure off-set the difficulties attendant upon a Michigan car shortage.

Work is being pushed on the new Hocking docks and it is confidently expected that this mammoth piece of construction will be finished by the opening of navigation next season, to the great advantage of Toledo. The domestic trade here is good for this season of the year. There are still occasional cars of coal being sold here at concessions from the list but this is invariably coal on track being moved to avoid demurrage and left on dealers' hands through some unforeseen mishap. Prices are being well maintained and dealers are all confident that coal will be even stronger later in the season, than now.

Prices as quoted on this market follow:

	Pocahontas	Hocking	Jackson	Pomeroy	Massilon	Pitts. No. 8	Cambridge
Domestic lump	$2.50	$1.60	$2.50	$1.75	$2.50	$1.35	$1.
Egg	2.25	1.20	2.50	1.50	2.50	....	....
Nut	1.80	1.20	2.25	1.50	2.50	....	....
¾ lump	....	1.35	....	....	....	1.20	1.20
Mine-run	1.50	1.10	....	....	....	1.10	1.10
Slack	....	0.70	....	....	....	0.80	....

COLUMBUS, OHIO

The car shortage has appeared and production is restricted. Prices well maintained and the tendency is upward. A new circular effective Sept. 1 shows advances in all grades.

The coal trade in Ohio during the past week has been at the mercy of the car supply to a large degree. As a result of a worse condition in that respect, strong quotations prevailed in every grade. The demand ruled good and taking it all in all the tone of the market was excellent.

The lack of cars was most noticeable in the Eastern Ohio field where the B. & O. and other roads have had trouble to keep mines in operation. It is estimated that the output in that district was 65% of normal. In the Pomeroy Bend district the car shortage was also bad and the production was considerably curtailed. In the Hocking Valley the output was about 75% of the average and the same percentage prevailed in the domestic fields.

The Lake trade is still active, although somewhat hampered by the car shortage. The demand for tonnage from the Northwest continues good and activity is expected to prevail right up to the close of navigation. Boats are still being chartered for September and October.

Domestic business is increasing in volume although the weather has not been the most favorable. Dealers are trying to accumulate stocks to guard against a car shortage. Consumers are ordering steadily and retailers are busy making deliveries. Operators are not inclined to book orders for domestic grades to be delivered in the future and the result is that all dealers are buying a great deal in the open market. Retail prices are strong and at a level higher than last year at this time.

Steam trade is also active and manufacturing establishments are consuming a large tonnage; in fact there appears to be an increase in their requisitions. Iron and steel concerns especially are good purchasers of steam tonnage while railroads are using a great deal of fuel to move the freight of the country. Steam contracts, when they expire, are being renewed at a higher value than last year.

A new circular, effective Sept. 1, will advance domestic lump to $1.75 and three-quarter inch to $1.60. Mine-run in the Hocking Valley and Pomeroy Bend will be $1.40.

Quotations in the Ohio fields are as follows:

	Hocking		Pomeroy	Kanawha
Domestic lump	$1.70 @ 1.65	....	$1.70 @ 1.65	$1.70 @ 1.65
3-4 inch	1.55 @ 1.50	$1.30 @ 1.25	1.45 @ 1.40	1.50 @ 1.40
Nut	1.30 @ 1.20	....	1.35 @ 1.30	....
Mine-run	1.35 @ 1.25	1.20 @ 1.15	1.30 @ 1.25	1.20 @ 1.25
Nut, pea and slack	0.70 @ 0.65	....	0.70 @ 0.65	0.65 @ 0.70
Coarse slack	0.60 @ 0.55	0.75 @ 0.70	0.60 @ 0.55	0.55 @ 0.50

HAMPTON ROADS, VA.

Coastwise and foreign shipments fair. Prices firm with a normal accumulation of coal at Tidewater.

Shipments from Hampton Roads during the past week have been fairly heavy. Some large cargoes have moved to the New England market as well as to foreign ports. Prices for New England and foreign shipments have ranged from $2.85 to $2.95 and even $3 has been asked by some of the suppliers, but so far as can be ascertained there have been no sales at this latter figure. Quite a number of the agencies are still short of coal and are only taking care of contract business.

There has been a fair demand from inland buyers for Pocahontas and New River coals, but little inquiry for gas splint, etc. In addition to coastwise and foreign cargoes loaded from Hampton Roads the U. S. Collier "Brutus" took a cargo of 4000 tons from Sewalls Point for use on the various vessels of the Atlantic Fleet.

LOUISVILLE, KY.

Almost a typical fall market already. Car shortage becoming more pronounced daily. Operators conservative on future business. Strike rumors also influencing the situation.

With the demand for coal steadily increasing and the supplies as consistently decreasing, the local market resembles conditions in December rather than the last of August. Normally at this time of the year the car supply is plentiful and the operators experience no difficulty in producing more than sufficient coal to meet all requirements, but now the car shortage is reaching serious proportions which, together with other difficulties, is making it difficult for the producers to meet the demand, with the result that the situation is already moderately tight.

The shortage of equipment is becoming more pronounced almost daily. There are already rumors of embargos being declared against Chicago and other Northern points, due to the difficulty in getting cars returned. There has been a heavy movement in that direction this summer and there is already a noticeable shortage of rolling stock. The situation is being further aggravated by the absolute refusal of many consignees to accept the new hopper bottom cars of the L. & N. R.R.; the tipple equipment at many of the mines is also not adapted to loading these cars. It is estimated that there are 2000 more local cars in the Northwest than last year, and that this, together with the general dissatisfaction with the new hopper-bottom equipment, accounts for the tight situation, and indications are that it will become steadily worse as the season advances.

Persistent rumors regarding the possibility of a strike in the eastern Kentucky field are also having an important bearing on the situation. Operators in that section are inclined to take a conservative attitude toward future commitments and are generally refusing to accept orders for the September delivery. The difficulty may reach a climax at any time or may drag on until winter, when the situation would be even more acute than at present. Organization among the miners there has heretofore met with prompt action by the operators, but it is understood that the unions are bringing more than ordinary pressure to bear in this instance.

Steam coal is probably the strongest branch in the local market while prices generally are at about the same level, 90c. being the prevailing quotation on Straight Creek, nut and slack, which is rather scarce; in western Kentucky nut and slack sells easily at from 50 to 55 cents.

DETROIT, MICH.

Market strong in every particular. Car shortage having a sharply stimulating effect on the situation. September circular will probably show some advances.

Bituminous—Both domestic and steam business have been active during the past week and the outlook for the future continues as encouraging as ever. The principal difficulty facing the producers at the moment is the impending car shortage which is, however, being anticipated in every way possible.

The steam consumption continues heavy, railroads requiring a large tonnage in order to take care of the excessive freight movement and manufacturing establishments are showing no disposition to decrease their demand. The steam trade is undoubtedly the strong feature in the local situation and the indications are that it will continue so indefinitely. The domestic business is also good, the large retail dealers ordering heavily in order to replenish their stocks; because of the heavy demand from their customers these are seriously depleted in many instances and in addition to this the dealers are anxious to anticipate the probable car shortage as much as possible. Prices for September

delivery have not yet been arranged and there is some uncertainty over business for that month. It is believed that a slight advance on the domestic grades will become effective Sept. 1. The Lake business continues as active as ever.

The local soft-coal market is quotable on about the following basis:

	W. Va. Splint	Gas	Hocking	Cambridge	No. 8 Ohio	Pocahontas	Jackson Hill
Domestic lump.	$1.65	....	$1.75	....	....	$2.75	$2.50
Egg	1.65	....	1.75	....	....	2.75	2.50
Steam lump	1.50	....	....	....	....	....	....
4-in. lump	1.25	$1.25	1.25	$1.25	$1.25	....	....
Mine-run	1.15	1.15	1.15	1.15	1.15	1.50	....
Slack	0.90	0.90	0.65	0.70	0.70	....	....

Anthracite—While apparently dull and featureless on the surface there are many indications of strong latent possibilities in the hard-coal market. Quotations on all grades are holding firmly at the circular with premiums of 25c. being demanded on some sizes. The indications are that the market will be firm throughout the season with the possible exception of a few isolated cases where some independent coal has accumulated.

BIRMINGHAM, ALA.

Demand good for all grades. Prices holding up well. Car shortage still handicapping operators, with no prospects of improvement. Pig iron firm with slightly better sales.

The operators in this district report that the demand for both steam and lump coal is exceptionally good, and that the prices are entirely satisfactory for this season of the year. As is generally the case, the higher grade coals, both steam and domestic, feel a depression less than the lower grades, but due to the fact that several of the railroads are storing a large quantity of fuel in anticipation of a serious car shortage this fall and winter, even the lower grade coals are moving as rapidly as cars can be obtained. The Louisville & Nashville R.R. is supplying their mines with cars exceptionally well, but the 'Frisco, Illinois Central, Queen & Crescent and Southern Railway are seriously affected, mines on their lines running only about one-half time. The railroads are holding out no hopes for a better car supply, and are sending out letters of warning to all shippers and consumers asking that they coöperate in loading and unloading all cars as fast as possible.

There is practically no change in the coke market over last week, either furnace or foundry. Sales of pig iron are slightly larger this week, with prices about the same, or possibly a shade better.

ST. LOUIS, MO.

Market advancing and coal moving freely with a good demand. Shortage of cars will have a steadying influence from this time on. Standard coals weak. No demand for anthracite, smokeless or coke.

Conditions are continuing to get better locally, and business in the country is exceptionally good. Prices on all coals, excepting Standard, are advancing and things are looking better for the operator. The Standard market, however, is dragging because of the overproduction. The future does not look exceptionally good for the Standard field, but other than that everything indicates high prices and a good demand.

The car shortage is not as pronounced this week as last, the mines getting not less than three days and in many instances four days. As usual, the coals with a trade name are bringing a premium of from 10 to 15c. a ton. There is absolutely no demand for smokeless, and very little coming in. The falling off is accounted for largely by the cheapness of anthracite, of which there is an abundance. The same applies to coke.,

	Carterville and Franklin Co.	Big Muddy	Mt. Olive	Standard
2-in. lump	.....	.....	.....	$1.00@1.05
3-in. lump	.....	.....	$1.30	.....
6-in. lump	$1.40 @ 1.60	.....	1.40	1.25@1.35
Lump and egg	1.50 @ 1.60	$2.10	1.40	.....
No. 1 nut	1.20 @ 1.30	.....	1.05	0.87½
Screenings	0.55	.....	0.40	0.85
Mine-run	1.50	.....	.....	0.75
No. 1 washed nut	1.50	.....	.....	.....
No. 2 washed nut	1.30	.....	.....	.....
No. 3 washed nut	1.20	.....	.....	.....
No. 4 washed nut	1.10	.....	.....	.....
No. 5 washed nut	0.60	.....	.....	.....

PORTLAND, ORE.

Some notes on the appearance of Coos Bay coal in the Pacific Coast markets.

The Southern Pacific interests announce that, their main source of immediate revenue from freight hauled over the railroad being built from Eugene to Coos Bay will be from coal. It is stated that the railroad company will put in large bunkers at the principal cities and towns in Oregon to be supplied with Coos Bay. Coal for Eugene, Salem. Roseburg, Medford and other Oregon towns is supplied from Wyoming and Utah mines and as a result it retails at from $10 to $14 a ton. Coos Bay coal can be sold for much less.

PRODUCTION AND TRANSPORTATION STATISTICS

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for July and first seven months of this year and last year in short tons:

	July		Seven Months	
	1913	1912	1913	1912
Anthracite	719,944	952,741	6,138,175	5,525,010
Bituminous	4,551,528	3,655,387	28,833,947	26,175,168
Coke	1,183,070	1,077,047	8,569,978	7,451,340
	6,454,542	5,685,175	43,542,100	39,151,518

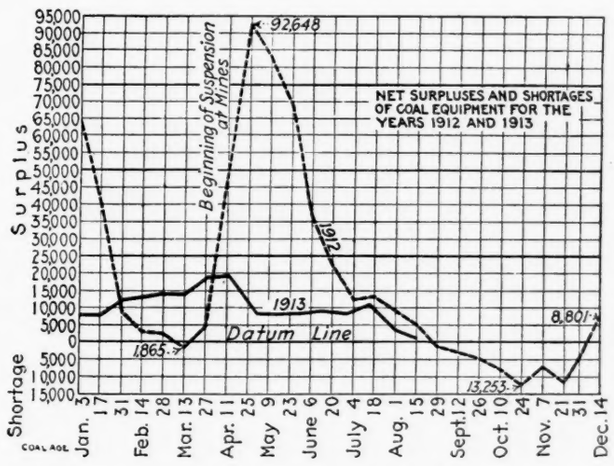
THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Aug. 15, as follows:

	Surplus	Shortage	Net*
New England Lines	10	185	175
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.	1,769	693	**1,096**
Ohio; Indiana; Michigan; Western Pennsylvania	200	2,152	1,952
West Virginia, Virginia, North & South Carolina	674	2,490	1,816
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida	125	916	791
Iowa, Illinois, Wis., Minn.; North & South Dakota	1,345	126	**1,219**
Montana, Wyoming, Nebraska	300	0	**300**
Kansas, Colorado, Missouri, Arkansas, Oklahoma	1,833	339	**1,494**
Texas, Louisiana, New Mexico	265	0	**265**
Oregon, Idaho, California, Arizona	1,752	137	**1,615**
Canadian Lines	0	0	0
Total	$8,293	$7,038	**1,255**

	Feb. 15	Mar. 15	Apr. 15	May 15	June 14	June 30	July 15	Aug. 1
Surplus	12,243	17,867	21,845	12,267	11,098	11,055	13,203	8,810
Shortage	7,196	3,776	2,196	4,226	2,033	2,821	1,826	4,029
Net*	**5,047**	**14,091**	**19,649**	**8,041**	**9,065**	**8,234**	**12,377**	**4,781**

***Bold face** type indicates a surplus.



SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for June and the first six months of the years 1912 and 1913:

State	June		Six Months	
	1912	1913	1912	1913
Missouri	153,363	187,723	1,490,145	1,421,534
Kansas	274,141	412,371	2,457,547	2,668,364
Arkansas	88,394	145,306	906,835	862,916
Oklahoma	156,535	255,481	1,380,230	1,663,849
Totals	672,343	1,000,881	6,234,757	6,616,663

NORFOLK & WESTERN RY.

The following is a statement of tonnages shipped over this road from mines in West Virginia and the commercial and company coal, for the month of June, in short tons:

Field	Shipped	Tipple	Total	Commercial	Company
Pocahontas	1,294,506	14,323	1,308,829	1,318,002	88,063
Tug River	215,912	2,278	218,190	181,578	36,612
Thacker	264,113	12,710	276,823	198,160	78,663
Kenova	70,815	8,512	79,327	68,039	11,288
Clinch Valley				149,624	13,863
	1,845,346	37,823	1,883,169	1,915,403	228,489

NORFOLK & WESTERN RY.

The following is a statement of the tonnages shipped over this road during July 1913, and for the seven months ending July 31, as compared with corresponding periods of 1912 in short tons:

Destination	July 1912	July 1913	Seven Months 1912	Seven Months 1913
Coal				
Tidewater, foreign	116,339	155,762	950,893	1,032,082
Tidewater, coastwise	305,515	321,340	2,119,813	2,224,658
Domestic	1,577,396	1,666,790	5,994,907	10,318,604
Coke				
Tidewater, foreign	9,197	4,358	50,101	27,199
Domestic	88,030	106,351	789,338	924,152
Total	2,096,477	2,254,601	13,905,052	14,526,695

IMPORTS AND EXPORTS

The following is a comparative statement of imports and exports in the United States for June, 1912-13, and for the twelve months ending June 1911-12-13, in long tons:

	12 Months			June	
Imports from:	1911	1912	1913	1912	1913
United Kingdom	13,458	6,846	9,398	155	648
Canada	1,452,116	1,082,522	1,336,387	119,489	80,533
Japan	14,481	13,168	79,072	3	260
Australia & Tasmania	276,279	195,713	150,150	13,447	9,325
Other countries	4,846	1,993	3,257	1	.....
Total	1,761,210	1,300,242	1,578,264	132,095	90,766
Exports:					
Anthracite	3,146,288	2,979,102	4,625,481	301,969	420,665
Bituminous,					
Canada	8,627,963	10,671,982	11,981,443	1,058,763	1,418,113
Panama	508,979	511,802	483,974	40,740	40,725
Mexico	619,447	344,712	443,884	38,640	37,635
Cuba	944,394	1,121,580	1,273,945	89,048	106,264
West Indies	513,368	692,534	601,431	42,657	51,376
Other countries	623,948	1,367,237	1,298,424	90,641	237,458
Total	11,839,099	14,709,847	16,083,101	1,360,489	1,891,571
Bunker coal	6,507,162	7,092,255	7,350,404	567,162	633,910

FOREIGN MARKETS

GERMANY

The following is a comparative statement of production for June and the first half of this year and last year:

	June 1912	June 1913	Half-year 1912	Half-year 1913
Coal	13,888,848	15,929,858	84,706,380	93,577,987
Lignite	6,217,498	6,858,699	39,480,142	41,900,158
Coke	2,315,126	2,610,818	13,454,682	15,944,237
Coal briquettes	426,025	490,067	2,488,763	2,878,665
Lignite ditto	1,508,075	1,727,160	9,123,691	10,303,617

Production, Consumption, Imports and Exports for the half year were as follows:

	Coal 1912	Coal 1913	Lignite 1912	Lignite 1913
Output	84,706,380	93,577,987	39,480,142	41,800,158
Imports*	4,553,826	5,364,127	3,685,486	3, 601 407
Exports*	19,176,907	21,836,212	584,553	998,034
Consumption	70,083,299	77,105,902	42,531,075	44,503,531

* Including coal the equivalent of coke and briquettes.

BELGIUM

The following is a comparative statement of the Belgium production for the first six months of the last two years:

	1913	1912
Hainaut:		
Couchant de Mons	2,147,000	1,782,820
Centre	1,691,030	1,648,730
Charleroi	4,001,800	4,227,270
Liege:		
Liege-Seraing	2,396,420	2,471,510
Plateau de Herve	582,500	602,780
Namur	402,800	402,180
Totals	11,221,550	11,135,290

GREAT BRITAIN

Aug. 15—Work has not yet been fully resumed in the coalfields and supplies are limited for prompt loading. In consequence prices are firm. There is a fair enquiry for forward loading. Quotations are approximately as follows:

Best Welsh steam	$4.98@5.04	Best Monmouthshires	$4.20@4.26
Best seconds	4.74@4.86	Seconds	4.02@4.08
Seconds	4.62@4.74	Best Cardiff smalls	2.70@2.82
Best dry coals	4.32@4.56	Seconds	2.46@2.58

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days.

COAL SECURITIES

The following table gives the range of various active coal securities and dividends paid during the week ending Aug. 23:

Stocks	Week's Range High	Week's Range Low	Week's Range Last	Year's Range High	Year's Range Low
American Coal Products	83	83	83	87	80
American Coal Products Pref	....	....	105	109½	105
Colorado Fuel & Iron	32⅜	31	31	41⅛	24⅛
Colorado Fuel & Iron Pref	....	....	155	155	150
Consolidation Coal of Maryland	102¼	102¼	102¼	102¼	102¼
Lehigh Valley Coal Sales	205	195	195	....	....
Island Creek Coal Com	52¼	52¼	52¼	52¼	47½
Island Creek Coal Pref	84½	83½	83½	82	80
Pittsburgh Coal	20⅜	19	19	24⅜	14½
Pittsburgh Coal Pref	84½	84¼	84⅜	95	73
Pond Creek	21⅜	20	20	23¾	16½
Reading	162	159½	161¼	168⅞	151⅜
Reading 1st Pref	....	....	86	92½	86
Reading 2nd Pref	88½	88½	88½	95	84
Virginia Iron, Coal & Coke	41	42	41	54	37½

Bonds	Closing Bid	Closing Asked	Week's Range or Last Sale		Year's Range	
Colo. F. & I. gen. s.f.g. 5s	93½	97	95½	July '13	93⅜	99⅛
Colo. F. & I. gen. 6s	103	106	107½	June '12	..	..
Col. Ind. 1st & coll. 5s. gu	83	83½	83	83	77½	85
Cons. Ind. Coal Me. 1st 5s	76	79	85	June '11	..	..
Cons. Coal 1st and ref. 5s	..	92½	93	Oct. '12	..	..
Gr. Riv. Coal & C. 1st g 6s	..	..	102⅜	April '06	..	..
K. & H. C. & C. 1st s f g 5s	91	..	98	Jan. '13	98	98
Pocah. Con. Coll. 1st s f 5s	..	85½	86½	June '13	86	87½
St. L. Rky. Mt. & Pac. 1st 5s	73	80	80	Aug. '13	73	80½
Tenn. Coal gen. 5s	..	99¼	98½	98½	103	
Birm. Div. 1st consol. 6s	100½	102	100⅝	Aug. '13	100⅝	103
Tenn. Div. 1st g 6s	100⅜	102	100½	July '13	100½	102
Cah. C. M. Co. 1st g 6s	..	..	103	July '13	103	103
Utah Fuel 1st g 5s	..	..	..	....	..	..
Victor Fuel 1st s f 5s	..	80	80	May '13	79½	80
Va. I. Coal & Coke 1st g 5s	92	93	92	Aug. '13	92	98

No Important Dividends were announced during the week.

COAL FREIGHT DECISIONS

Suspension Docket No. 181—Rates from West Virginia and Kentucky to points in Wisconsin.

Soft coal originating on the lines of certain of the defendant carriers and destined to points beyond Milwaukee, Manitowoc and Kewaunee, Wis., has, for 10 or more years, moved over the across-lake routes to those points at the Chicago rates. By the tariffs under suspension the carriers undertook to close certain of the routes and cancel the rates applicable to them because of a failure to arrive at agreements following a demand on the part of the delivering carrier for an increase in its division; **Held,** That the suspended tariffs must be withdrawn and the present routes kept open. An advance of 10 cents per ton in the rates is permitted. **Opinion No. 2335.**

I. C. C. No. 4773—Montana Railroad Commissioners vs. Denver & Rio Grande R.R.

Rate of $5 per ton charged by defendants prior to Dec. 27, 1911, for transportation of coal in carloads from Sunnyside, Utah, to Helena, Mont., not shown to have been unreasonable. Increase of 10c. per ton in the rate as of the date mentioned found not justified by defendants and therefore unreasonable. **Opinion No. 4377.**

I. C. C. No. 3811—Consolidated Fuel Co. (Utah) vs. Atchison, Topeka & Santa Fé Ry.

1. The Denver & Rio Grande Ry. Co. in competing commercially in interstate coal markets, through the operations of a coal company owned by it, not only violates the commodities clause of the act, but is guilty of an unjust rate discrimination against the complainants, in that the group rates apply only from its junction with the industrial lines of the complainants, while they are applicable directly from its own mines on its own branch lines, the latter being operated under general conditions substantially similar to those surrounding the operation of the industrial lines of the complainants.
2. Without entering an order, several forms of relief which the complainants may have under the circumstances of the case are indicated on the report, and the tariffs in question are required promptly to be adjusted in one form or the other, the rate situation as readjusted to be maintained so long as the Denver & Rio Grande competes commercially in interstate markets with the complainants.